UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5

IN THE MATTER OF:)	 Docket No. $V = W = 13 \circ C = J09$
North Plant)	
Manufactured Gas Plant Site)	ADMINISTRATIVE SETTLEMENT
Waukegan, Lake County, Illinois)	AGREEMENT AND ORDER ON
()	CONSENT FOR REMOVAL
)	ACTION
North Shore Gas,)	
Respondent)	Proceeding under Sections 104, 106(a),
)	107, and 122 of the Comprehensive
)	Environmental Response,
)	Compensation and Liability Act,
)	 as amended 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622

US EPA RECORDS CENTER REGION 5

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency ("U.S. EPA") and Respondent, North Shore Gas Company ("Respondent"). This Settlement Agreement provides for the performance of a removal action by Respondent and the reimbursement of certain response costs incurred by the United States at or in connection with property located at 849 Pershing Road, Waukegan, Illinois ("North Plant Site").

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended ("CERCLA"). This authority has been delegated to the Administrator of the U.S. EPA by Executive Order No. 12580, January 23, 1987, 52 Federal Register 2923, and further delegated to the Regional Administrators by U.S. EPA Delegation Nos. 14-14-A, 14-14-C and 14-14-D, and to the Director, Superfund Division, Region 5, by Regional Delegation Nos. 14-14-A, 14-14-C and 14-14-D.

3. U.S. EPA has notified the State of Illinois (the "State") of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

4. U.S. EPA and Respondent recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of facts, conclusions of law, and determinations in Sections IV and V of this Settlement Agreement. Respondent agrees to comply with and be bound by the terms of this Settlement Agreement and further agrees that it will not contest the basis or validity of this Settlement Agreement or its terms.

II. <u>PARTIES BOUND</u>

5. This Settlement Agreement applies to and is binding upon U.S. EPA and upon Respondent and its successors and assigns. Any change in ownership or corporate status of the Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter the Respondent's responsibilities under this Settlement Agreement.

6. Respondent shall ensure that its contractors, subcontractors, and representatives comply with this Settlement Agreement. Respondent shall be responsible for any noncompliance with this Settlement Agreement.

III. <u>DEFINITIONS</u>

7. Unless otherwise expressly provided herein, terms used in this Settlement Agreement which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. "AOC" or "Settlement Agreement" shall mean this Agreement and all appendices attached hereto. In the event of conflict between the AOC and any appendices, this AOC shall control.

b. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, et seq.

c. "Day" shall mean a calendar day unless expressly stated to be a business day. "Business day" shall mean a day other than a Saturday, Sunday, or Federal holiday. In computing any period of time under this AOC, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next business day.

d. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXVIII.

e. "Future Response Costs" or "Oversight Costs" shall mean all costs, including direct and indirect costs that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement on or after the Effective Date.

f. "Interest" shall mean interest at the rate specified for interest on investments of the U.S. EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

g. "MGP" shall mean manufactured gas plant.

h. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

i. "PAHs" shall mean polycyclic aromatic hydrocarbons.

j. "Paragraph" shall mean a portion of this AOC identified by an Arabic numeral or a letter.

k. "Parties" shall mean the U.S. EPA and the Settling Respondent.

1. "Respondent" shall mean North Shore Gas Company.

m. "Site" or "North Plant Site" shall mean the property located at 849 Pershing Road, Waukegan, Illinois and depicted in Appendix 1.

n. "State" shall mean the State of Illinois.

0. "U.S. EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

p. "Waste Material" shall mean 1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); 2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and 3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

q. "Work" shall mean all activities Respondent is required to perform under this Settlement Agreement except those required by the provisions of Section XI dealing with the retention of records.

IV. FINDINGS OF FACT

8. Based on available information, including the Administrative Record in this matter, U.S. EPA hereby finds that:

a. The North Plant Former MGP Site is located at 849 Pershing Road, Waukegan, Illinois. The Site currently encompasses approximately 16 acres and is vacant with the exception of some concrete foundations. The Site and surrounding areas are currently zoned for light industrial/commercial purposes. The City of Waukegan's Lakefront-Downtown Master Plan (2003) and Design Guidelines (2005) show the Site as being located in a future open space recreational area.

b. Although ownership of the property that constitutes the former North Plant MGP has changed over time, the northern portion of the former MGP property is

currently owned by North Shore Gas. North Shore Gas transferred ownership of the entire MGP property to the City of Waukegan in 1975, and the City sold the northern portion of the property to the North Shore Sanitary District ("NSSD") in 1982. North Shore Gas repurchased this northern portion of the property from NSSD in 2002. The small parcel on the southern portion of the property owned by North Shore Gas during the MGP operating period is currently owned and used by the City of Waukegan as a burning and composting area. MGP operations were not conducted on this parcel. The Wisconsin Central Ltd, formerly the Elgin, Joliet and Eastern Railway (EJ & E), owns a portion of the northeast corner of the Site.

c. The North Plant MGP was constructed in 1912 as a gas production and storage facility. Prior to its excavation in 1992, a tar pond (the "Waukegan Tar Pit") was located in the northeast corner of the Site. The facility was operated by North Shore Gas as a manufactured gas plant and storage facility between 1912 and 1953. Gas was manufactured via coal carbonization (1912–1927), water gas (1927–1951), and oil gas (1951–1953) processes. From 1953 to 1965, the facility provided a propane-air supplement to natural gas suppliers. Documents indicate potential contamination and migration of contaminants during plant demolition activities, including the rupture of a relief holder which released 400,000 gallons of water, tar emulsion, and tar to the soil.

d. Groundwater is encountered at 2 to 5 feet below ground surface ("bgs"). Lake Michigan is the source of drinking water in the Waukegan area, and the water supply intake is approximately two miles southeast of the Site. The general direction of groundwater flow at the Site is to the east, but the influence of the retention basins and dewatering wells on the adjacent NSSD property causes the groundwater flow direction to vary. Chemicals detected in groundwater samples collected during investigations at the Site include VOCs (primarily BETX and chlorinated solvent compounds), SVOCs (primarily PAHs and phenols), metals, and cyanide.

e. The uppermost layer of soil at the Site is miscellaneous fill material composed of sand, gravel and clinker. Gypsum was also encountered on the eastern edge of the Site. Between 0.5 to 1.5 feet of native peat was encountered immediately below the fill materials, with fine to medium sand underlying the peat layer to 22 feet bgs. Impacted soils were found as early as 1968 during plant closure activities when free tar removal efforts were conducted at an on-site ditch. Later, stained soils with strong odors and heavy oil sheens were observed during site investigations. Although the Waukegan Tar Pit was excavated in 1992, tar impacts were observed well beyond the limits of the excavation; the volume of soil containing tar and tarry residues in areas surrounding the former Waukegan Tar Pit was estimated at 67,400 cubic yards. Evidence of chlorinated solvents, free phase coal tar, and oily hydrocarbons has been observed in soil samples collected at the Site. The contaminants found in soil samples collected during site investigations include VOCs, SVOCs (including PAHs), metals, and cyanide.

f. Free tar removal efforts were performed at a ditch located on the Site during the initial plant closing in 1968; 25,000 tons of tar was removed at this time. North

Shore Gas performed removal activities to address impacted material at the Waukegan Tar Pit under an Administrative Order issued by the U.S. EPA in 1992. Visible free-phase tar was excavated, and the excavated area was covered with a high-density polyethylene ("HDPE") cover. Additional site characterization at the tar pit was conducted in 1995, and soil and groundwater sampling was conducted in other portions of the Site in 2002 and 2004. Tarimpacted materials were identified in several areas, including: the northeast portion near the Waukegan Tar Pit; the eastern and southeastern portions along the EJ&E railroad tracks; the northwest portion near the former aboveground gas holder and generator house; the center portion near the former purifying house and coke bins; and the southwest portion near a former tar pit structure.

g. The North Plant Site has not been proposed to the National Priorities List (NPL). It is, however, designated as a Superfund Alternative (SA) site, requiring the site to go through the Superfund remedial cleanup process, as described in the NCP.

h. In July 2007, U.S. EPA and Respondent entered into an Administrative Order on Consent for the Respondent to conduct a remedial investigation and feasibility study of the Site.

i. Previous site investigations performed by Respondent on the Site have confirmed the presence of tar and tar-like material in both surface and subsurface soil. The presence of these hazardous substances warrants this time-critical removal action.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

9. Based on the Findings of Fact set forth above, and the Administrative Record supporting this removal action, U.S. EPA has determined that:

a. The Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found on portions of the Site, as identified in the Findings of Fact above, includes "hazardous substance(s)" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

c. The Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

d. The Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is liable for the performance of this response action and for response costs incurred and to be incurred at the Site.

i. The Respondent is the present "owner" and/or "operator" of all or a portion of the Site as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20).

ii. The Respondent is also an "owner" and/or "operator" of the Site at the time of disposal of hazardous substances at the Site, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2); and/or persons who arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment of hazardous substances at the Site, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3); and/or persons who accept or accepted hazardous substances for transport to the Site, within the meaning of Section 107(a)(4) of CERCLA, 42 U.S.C. § 9607(a)(4).

e. The conditions described in the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility into the "environment" as defined by Sections 101(22) and 101(8) of CERCLA, 42 U.S.C.§§ 9601(22) and 9601(8).

f. The conditions present on portions of the Site constitute a threat to public health, welfare, or the environment based upon the factors set forth in Section 300.415(b)(2) of the NCP, 40 CFR § 300.415(b)(2). These factors include, but are not limited to, the following:

i. actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants;

This factor is present due to exposed MGP residual materials, including weathered tar at ground surface, where TPH concentrations exceed the default value of 2,000 mg/kg (TACO) for soil attenuation capacity. TPH is assumed to be representative of the primary constituents of concern including benzene, toluene, ethylbenzene, xylenes and total PAH. Subsurface migration also presents a potential exposure to groundwater and Lake Michigan.

ii. high levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

This factor is present as MGP residuals in soil were identified at the surface, containing elevated levels of contaminants exceeding the State's TACO cleanup levels and EPA RMLs as described above. Trespassers may come in contact with contaminated soil in the surface either through dermal contact or inhalation. Typical security measures, including fencing, are currently employed to limit potential exposure.

iii. Actual or potential contamination of drinking water supplies or sensitive ecosystems;

This factor is present as depth to groundwater in the area varies from 2-5 ft below ground surface. Groundwater flows east towards Lake Michigan and organics contained in the DNAPL may leach into the groundwater and migrate to Lake Michigan.

iv. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

This factor is present as migration could occur as a result of wind action during dry periods, which could pose a breathing hazard. Such wind action could also lead to deposition of materials in uncontaminated areas. Migration of contaminants in surface soil could also occur through surface water flow or groundwater flow during wet periods, due to the high levels of PAHs and benzene found in some of the samples.

g. The removal action required by this Settlement Agreement at the Site is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement Agreement, will be considered consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

VI. SETTLEMENT AGREEMENT AND ORDER

10. Based upon the foregoing Findings of Fact, Conclusions of Law, Determinations, and the Administrative Record for the Site, it is hereby Ordered and Agreed that Respondent shall comply with all provisions of this Settlement Agreement, including, but not limited to, all attachments to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. <u>DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR,</u> <u>AND ON-SCENE COORDINATOR</u>

11. Respondent shall retain one or more contractors to perform the Work and shall notify U.S. EPA of the name and qualifications of such contractor within 5 business days of the Effective Date. Respondent shall also notify U.S. EPA of the name and qualification of any other contractor or subcontractor retained to perform the Work at least 5 business days prior to commencement of such Work. U.S. EPA retains the right to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If U.S. EPA disapproves of a selected contractor, Respondent shall retain a different contractor and shall notify U.S. EPA of that contractor's name and qualifications within 3 business days of U.S. EPA's disapproval. The contractor must demonstrate compliance with ANSI/ASQC E-4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared consistent with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B0-1/002), or equivalent documentation as required by U.S. EPA.

12. Respondent has designated Narendra Prasad as Project Coordinator for the Site. The Project Coordinator shall be responsible for administration of all actions by Respondent required by this Settlement Agreement. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site work. U.S. EPA retains the right to disapprove of the designated Project Coordinator. If U.S. EPA disapproves of the designated Project Coordinator. If U.S. EPA disapproves of the designated Project Coordinator. Respondent shall retain a different Project Coordinator and shall notify U.S. EPA of that person's name, address, telephone number, and qualifications within 4 business days following U.S. EPA's disapproval. Receipt by Respondent's Project Coordinator of any notice or

communication from U.S. EPA relating to this Settlement Agreement shall constitute receipt by Respondent.

13. U.S. EPA has designated Jaime Brown of the Superfund Division, Removal Response Branch, Region 5, as its On-Scene Coordinator ("OSC"). Except as otherwise provided in this Settlement Agreement, Respondent shall direct all submissions required by this Settlement Agreement to the OSC at U.S. EPA, Superfund Division, 77 West Jackson Boulevard, SE-5J, Chicago, Illinois 60604-3590, by certified or express mail. Respondent shall also send a copy of all submissions to Peter Felitti, Assistant Regional Counsel, 77 West Jackson Boulevard, C-14J, Chicago, Illinois, 606004-3590. Respondent is encouraged to make its submissions to U.S. EPA on recycled paper (which includes significant post consumer waste paper content where possible) and using two-sided copies.

14. U.S. EPA and Respondent shall have the right, subject to Paragraph 12, to change their respective designated OSC or Project Coordinator. U.S. EPA shall notify the Respondent, and Respondent shall notify U.S. EPA, as early as possible before such a change is made, but in no case less than 24 hours before such a change. The initial notification may be made orally but it shall be promptly followed by a written notice.

VIII. WORK TO BE PERFORMED

15. Respondent shall perform and complete the removal action required by this Settlement Agreement on the portions of the Site depicted in Appendix 2 in accordance with the provisions of this Settlement Agreement and the attached Work Plan, Appendix 3.

16. Respondent shall not commence implementation of the Work Plan developed hereunder until receiving written approval from U.S. EPA.

17. <u>Health and Safety Plan</u>. Respondent shall implement the health and safety plan previously reviewed by U.S. EPA. Respondent shall implement the plan during the pendency of the removal action.

18. Quality Assurance and Sampling.

a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to U.S. EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate U.S. EPA guidance. Respondent shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements

for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by U.S. EPA. U.S. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

b. Upon request by U.S. EPA, Respondent shall have such a laboratory analyze samples submitted by U.S. EPA for QA monitoring. Respondent shall provide to U.S. EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

c. Upon request by U.S. EPA, Respondent shall allow U.S. EPA or its authorized representatives to take split and/or duplicate samples. Respondent shall notify U.S. EPA not less than 3 business days in advance of any sample collection activity, unless shorter notice is agreed to by U.S. EPA. U.S. EPA shall have the right to take any additional samples that U.S. EPA deems necessary. Upon request, U.S. EPA shall allow Respondent to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

19. Reporting.

a. Respondent shall submit a written progress report for the Site to U.S. EPA concerning actions undertaken pursuant to this Settlement Agreement every 30th day after the Effective Date of this Settlement Agreement until termination of this Settlement Agreement, unless otherwise directed in writing by the OSC. The report shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, analyticated problems, and planned resolutions of past or anticipated problems.

b. Respondent shall submit 3 copies of all plans, reports or other submissions required by this Settlement Agreement, or any approved work plan. Upon request by U.S. EPA, Respondent shall submit such documents in electronic form.

c. If the Respondent owns or controls any portion of the Site, it shall, at least 30 days prior to the conveyance of any interest in real property at the Site, give written notice to the transferee that the property is subject to this Settlement Agreement and written notice to U.S. EPA of the proposed conveyance, including the name and address of the transferee. For property the Respondent owns or controls, it also agrees to require that its successors comply with the immediately preceding sentence and Sections IX (Site Access) and X (Access to Information).

20. <u>Final Report</u>. Within 60 calendar days after completion of all Work at the Site that is required by Section VIII of this Settlement Agreement, Respondent shall submit for U.S. EPA review a final report summarizing the actions taken to comply with this Settlement Agreement. The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports" and with the guidance set forth in "Superfund Removal

Procedures: Removal Response Reporting - POLREPS and OSC Reports" (OSWER Directive No. 9360.3-03, June 1, 1994). The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Settlement Agreement, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal action (e.g., manifests, invoices, bills, contracts, and permits). The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

"Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

21. Off-Site Shipments.

a. Respondent shall, prior to any off-Site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of waste material to the appropriate state environmental official in the receiving facility's state and to the OSC. However, this notification requirement shall not apply to any off-Site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

i. Respondent shall include in the written notification the following information: 1) the name and location of the facility to which the Waste Material is to be shipped; 2) the type and quantity of the Waste Material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

ii. The identity of the receiving facility and state will be determined by Respondent following the award of the contract for the removal action. Respondent shall provide the information required by this Paragraph 21(a) and 21(b) as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondent shall obtain U.S. EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

IX. SITE ACCESS

22. If the Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by the Respondent, the Respondent shall, commencing on the Effective Date, provide U.S. EPA, the State, and their representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement.

23. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall use its best efforts to obtain all necessary access agreements within 20 business days after the Effective Date, or as otherwise specified in writing by the OSC, whichever date is later. Respondent shall immediately notify U.S. EPA if after using its best efforts it is unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access, though "best efforts" shall not include monetary payments where the current owner is a potentially responsible party. Respondent shall describe in writing its efforts to obtain access. U.S. EPA may then assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as U.S. EPA deems appropriate. Respondent shall reimburse U.S. EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XV (Payment of Response Costs).

24. Notwithstanding any provision of this Settlement Agreement, U.S. EPA and the State retain all of their access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

X. ACCESS TO INFORMATION

25. Respondent shall provide to U.S. EPA, upon request, copies of all documents and information within its possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make available to U.S. EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

26. Respondent may assert business confidentiality claims covering part or all of the documents or information submitted to U.S. EPA under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by U.S. EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to U.S. EPA, or if U.S. EPA has notified Respondent that the documents or information are not confidential under the standards

of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondent.

27. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, it shall provide U.S. EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

28. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around a Site.

XI. <u>RECORD RETENTION</u>

29. Until 6 years after Respondent's receipt of U.S. EPA's notification pursuant to Section XXVI (Notice of Completion of Work), Respondent shall preserve and retain all nonidentical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 6 years after Respondent's receipt of U.S. EPA's notification pursuant to Section XXVI (Notice of Completion of Work), Respondent shall also instruct its contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work.

30. At the conclusion of this document retention period, Respondent shall notify U.S. EPA at least 60 days prior to the destruction of any such records or documents, and, upon request by U.S. EPA, Respondent shall deliver any such records or documents to U.S. EPA. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondent asserts such a privilege, it shall provide U.S. EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

31. Respondent hereby certifies that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by U.S. EPA or the State or the filing of suit against it regarding the Site and that it has fully complied and will fully comply with any and all U.S. EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XII. <u>COMPLIANCE WITH OTHER LAWS</u>

32. Respondent shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-Site actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by U.S. EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws.

XIII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

33. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the OSC or, in the event of his/her unavailability, the Regional Duty Officer, Emergency Response Branch, Region 5 at (312) 353-2318, of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and U.S. EPA takes such action instead, Respondent shall reimburse U.S. EPA all costs of the response action not inconsistent with the NCP pursuant to Section XV (Payment of Response Costs).

34. In addition, in the event of any release of a hazardous substance from the Site, Respondent shall immediately notify the OSC at (312) 353-2318 and the National Response Center at (800) 424-8802. Respondent shall submit a written report to U.S. EPA within 7 business days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, et seq.

XIV. AUTHORITY OF ON-SCENE COORDINATOR

35. The OSC shall be responsible for overseeing Respondent's implementation of this Settlement Agreement. The OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the Site. Absence of the OSC from the Site shall not be cause for stoppage of work unless specifically directed by the OSC.

XV. PAYMENT OF RESPONSE COSTS

36. Payments for Future Response Costs.

a. Respondent shall pay U.S. EPA all Future Response Costs not inconsistent with the NCP. On a periodic basis, U.S. EPA will send Respondent a bill requiring payment that consists of an Itemized Cost Summary. Respondent shall make all payments within 30 calendar days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 38 of this Settlement Agreement according to the following procedures.

i. If the payment amount demanded in the bill is for \$10,000 or greater, payment shall be made to U.S. EPA by Electronic Funds Transfer ("EFT") in accordance with current EFT procedures to be provided to Respondent by U.S. EPA Region 5. Payment shall be accompanied by a statement identifying the name and address of the Respondent, the Site name, U.S. EPA Region 5, and the Site/Spill ID Number B5HQ.

ii. If the amount demanded in the bill is \$10,000 or less, the Respondent may in lieu of the procedures in subparagraph 36(a)(i) make all payments required by this Paragraph by a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund," referencing the name and address of the party making the payment, and the EPA Site/Spill ID Number B5HQ. Respondent shall send the check(s) to:

> US Environmental Protection Agency Superfund Payments Cincinnati Finance Center PO Box 979076 St. Louis, MO 63197-9000

For checks sent by express mail:

U.S. Bank 1005 Convention Plaza Mail Station SL-MO-C2GL St. Louis, MO 63101

Wire transfers should be directed to the Federal Reserve Bank of New York

Federal Reserve Bank of New York

ABA = 021030004 Account = 68010727 SWIFT address = FRNYUS33 33 Liberty Street New York NY 10045

Field Tag 4200 of the Fedwire message should read "D 68010727 Environmental Protection Agency "

b. At the time of payment, Respondent shall send notice that payment has been made to the Director, Superfund Division, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois, 60604-3590 and to Peter Felitti, Associate Regional Counsel, 77 West Jackson Boulevard, C-14J, Chicago, Illinois, 60604-3590.

c. The total amount to be paid by Respondent pursuant to Paragraph 36(a) shall be deposited in the North Shore Gas Special Account within the U.S. EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by U.S. EPA to the U.S. EPA Hazardous Substance Superfund.

37. In the event that the payment for Future Response Costs is not made within 30 days of Respondent's receipt of a bill, Respondent shall pay Interest on the unpaid balance. The Interest on Future Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated penalties pursuant to Section XVIII.

38. Respondent may dispute all or part of a bill for Future Response Costs submitted under this Settlement Agreement, only if Respondent alleges that U.S. EPA has made an accounting error, or if Respondent alleges that a cost item is inconsistent with the NCP. If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondent shall pay the full amount of the uncontested costs to U.S. EPA as specified in Paragraph 36 on or before the due date. Within the same time period, Respondent shall pay the full amount of the contested costs into an interest-bearing escrow account. Respondent shall simultaneously transmit a copy of both checks to the persons listed in Paragraph 36(b) above. Respondent shall ensure that the prevailing party in the dispute shall receive the amount upon which they prevailed from the escrow funds plus interest within 20 calendar days after the dispute is resolved.

XVI. DISPUTE RESOLUTION

39. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.

40. If Respondent objects to any U.S. EPA action taken pursuant to this Settlement Agreement, including billings for Future Response Costs, it shall notify U.S. EPA in writing of its objection(s) within 10 calendar days of such action, unless the objection(s) has/have been resolved informally. This written notice shall include a statement of the issues in dispute, the relevant facts upon which the dispute is based, all factual data, analysis or opinion supporting Respondent's position, and all supporting documentation on which such party relies. U.S. EPA shall provide its Statement of Position, including supporting documentation, no later than 10 calendar days after receipt of the written notice of dispute. In the event that these 10-day time periods for exchange of written documents may cause a delay in the work, they shall be shortened upon, and in accordance with, notice by U.S. EPA. The time periods for exchange of written documents relating to disputes over billings for response costs may be extended at the sole discretion of U.S. EPA. An administrative record of any dispute under this Section shall be maintained by U.S. EPA. The record shall include the written notification of such dispute, and the Statement of Position served pursuant to the preceding paragraph. Upon review of the administrative record, the Director of the Superfund Division, U.S. EPA Region 5, shall resolve the dispute consistent with the NCP and the terms of this Settlement Agreement.

41. Respondent's obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with U.S. EPA's decision, whichever occurs.

XVII. FORCE MAJEURE

42. Respondent agrees to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a force majeure. For purposes of this Settlement Agreement, a force majeure is defined as any event arising from causes beyond the control of Respondent, or of any entity controlled by Respondent, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondent's best efforts to fulfill the obligation. Force majeure does not include financial inability to complete the Work or increased cost of performance.

43. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a force majeure event, Respondent shall notify U.S. EPA orally within 24 hours of when Respondent first knew that the event might cause a delay. Within 7 calendar days thereafter, Respondent shall provide to U.S. EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a force majeure event if they intend to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall be grounds for U.S. EPA to deny Respondent an

extension of time for performance. Respondent shall have the burden of demonstrating by a preponderance of the evidence that the event is a force majeure, that the delay is warranted under the circumstances, and that best efforts were exercised to avoid and mitigate the effects of the delay.

44. If U.S. EPA agrees that the delay or anticipated delay is attributable to a force majeure event, the time for performance of the obligations under this Settlement Agreement that are affected by the force majeure event will be extended by U.S. EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation. If U.S. EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, U.S. EPA will notify Respondent in writing of its decision. If U.S. EPA agrees that the delay is attributable to a force majeure event, U.S. EPA will notify Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure aftected by the force majeure event.

XVIII. STIPULATED PENALTIES

45. Respondent shall be liable to U.S. EPA for stipulated penalties in the amounts set forth in Paragraph 46 for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVII (Force Majeure). "Compliance" by Respondent shall include completion of the activities under this Settlement Agreement or any work plan or other plan approved under this Settlement Agreement identified below in accordance with all applicable requirements of this Settlement Agreement within the specified time schedules established by and approved under this Settlement Agreement.

46. Stipulated Penalty Amounts.

Deliverable/Activity	Penalty for Days 1 - 7	Penalty for > 7 Days
Late submittal of Progress Reports or other miscellaneous Reports/Submittals	\$250/day	\$500/day
Failure to meet any other scheduled Deadline in the AOC, or Work Plans	\$250/day	\$500/day

47. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: 1) with respect to a deficient submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after U.S. EPA's receipt of such submission until the date that U.S. EPA notifies Respondent of any deficiency; and 2) with respect to a decision by the Director of the Superfund Division, Region 5, under Paragraph 40 of Section XVI (Dispute Resolution), during the period, if any, beginning on the 21st day after U.S. EPA submits its written statement of position until the date that the Director of the Superfund Division issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

48. Following U.S. EPA's determination that Respondent has failed to comply with a requirement of this Settlement Agreement, U.S. EPA may give Respondent written notification of the failure and describe the noncompliance. U.S. EPA may send Respondent a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether U.S. EPA has notified Respondent of a violation.

49. All penalties accruing under this Section shall be due and payable to U.S. EPA within 30 days of Respondent's receipt from U.S. EPA of a demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures under Section XVI (Dispute Resolution). All payments to U.S. EPA under this Section shall be paid by certified or cashier's check(s) made payable to "U.S. EPA Hazardous Substances Superfund," shall be mailed to:

US Environmental Protection Agency Fines and Penalties Cincinnati Finance Center PO Box 979077 St. Louis, MO 63197-9000

The cover letter shall indicate that the payment is for stipulated penalties, and shall reference the U.S. EPA Site/Spill ID Number B5HQ, the U.S. EPA Docket Number, and the name and address of the Respondent. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to U.S. EPA as provided in Paragraph 36(b).

50. The payment of penalties shall not alter in any way Respondent's obligation to complete performance of the Work required under this Settlement Agreement.

51. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 20 days after the dispute is resolved by agreement or by receipt of U.S. EPA's decision.

52. If Respondent fails to pay stipulated penalties when due, U.S. EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph

48. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of U.S. EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(l) of CERCLA, 42 U.S.C. §§ 9606(b) and 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that U.S. EPA shall not seek civil penalties pursuant to Section 106(b) or 122(l) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of this Settlement Agreement. Should Respondent violate this Settlement Agreement or any portion hereof, U.S. EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Settlement Agreement pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. Notwithstanding any other provision of this Section, U.S. EPA may, in its unreviewable discretion, waive in writing any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XIX. COVENANT NOT TO SUE BY U.S. EPA

53. In consideration of the actions that will be performed and the payments that will be made by Respondent under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, U.S. EPA covenants not to sue or to take administrative action against Respondent pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work and Future Response Costs. This covenant not to sue shall take effect upon the Effective Date and is conditioned upon the complete and satisfactory performance by Respondent of all obligations under this Settlement Agreement, including, but not limited to, payment of Future Response Costs pursuant to Section XV. This covenant not to sue extends only to Respondent and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY U.S. EPA

54. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of U.S. EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent U.S. EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement. U.S. EPA also reserves the right to take any other legal or equitable action as it deems appropriate and necessary, or to require the Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.

55. The covenant not to sue set forth in Section XIX above does not pertain to any matters other than those expressly identified therein. U.S. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondent with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondent to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definition of Future Response Costs;

c. liability for performance of response action other than the Work, including but not limited to conducting an EE/CA on the Site;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside the Site; and

g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site.

XXI. COVENANT NOT TO SUE BY RESPONDENT

56. Respondent covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Future Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Illinois Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Site.

57. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. §300.700(d).

XXII. OTHER CLAIMS

58. By issuance of this Settlement Agreement, the United States and U.S. EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. The United States or U.S. EPA shall not be deemed a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

59. Nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

60. No action or decision by U.S. EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. §9613(h). Also, Respondent agrees not to seek judicial review of the final rule listing the Site on the NPL based on a claim that changed site conditions that resulted from the performance of the Work in any way affected the basis for listing the Site.

XXIII. CONTRIBUTION

61. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that Respondent is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work and Future Response Costs.

b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42. U.S.C. § 9613(f)(3)(B), pursuant to which the Respondent has, as of the Effective Date, resolved its liability to the United States for the Work and Future Response Costs.

XXIV. INDEMNIFICATION

62. Respondent shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondent agrees to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, subcontractors and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Settlement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondent in carrying out activities pursuant to this Settlement. Neither Respondent nor any such contractor shall be considered an agent of the United States. The Federal Tort

Claims Act (28 U.S.C. §§ 2671, 2680) provides coverage for injury or loss of property, or injury or death caused by the negligent or wrongful act or omission of an employee of U.S. EPA while acting within the scope of his or her employment, under circumstances where U.S. EPA, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred.

63. The United States shall give Respondent notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondent prior to settling such claim.

64. Respondent waives all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondent shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXV. MODIFICATIONS

65. The OSC may make modifications to any plan or schedule in writing or by oral direction. Any oral modification will be memorialized in writing by U.S. EPA promptly, but shall have as its effective date the date of the OSC's oral direction. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties.

66. If Respondent seeks permission to deviate from any approved work plan or schedule, Respondent's Project Coordinator shall submit a written request to U.S. EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving oral or written approval from the OSC pursuant to Paragraph 65.

67. No informal advice, guidance, suggestion, or comment by the OSC or other U.S. EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXVI. NOTICE OF COMPLETION OF WORK

68. When U.S. EPA determines, after U.S. EPA's review of the Final Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including, e.g., post-removal site controls, payment of Future Response Costs, and record retention, U.S. EPA will provide written notice to Respondent. If U.S. EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, U.S. EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the Work Plan if appropriate in order to correct such deficiencies. Respondent shall implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the U.S. EPA notice. Failure by Respondent to implement the approved modified Work Plan shall be a violation of this Settlement Agreement.

XXVII. <u>SEVERABILITY/INTEGRATION/ATTACHMENTS</u>

69. If a court issues an order that invalidates any provision of this Settlement Agreement or finds that Respondent has sufficient cause not to comply with one or more provisions of this Settlement Agreement, Respondent shall remain bound to comply with all provisions of this Settlement Agreement not invalidated or determined to be subject to a sufficient cause defense by the court's order.

70. This Settlement Agreement and its attachments constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following attachments are incorporated into this Settlement Agreement:

Appendix 1- Site Location Map

Appendix 2- Site Diagram Showing Location of Work

Appendix 3- Work Plan

XXVIII. EFFECTIVE DATE

71. This Settlement Agreement shall be effective upon signature by the Director, Superfund Division, U.S. EPA Region 5.

The undersigned representative of the Respondent certifies that he/she is fully authorized to enter into the terms and conditions of this Settlement Agreement and to bind the party they represent to this document.

Agreed this <u>1</u> day of <u>March</u>, 2013.

For Respondent North Shore Gas Company

By: Willard S. Evans; Jr

Title: President

IN THE MATTER OF:

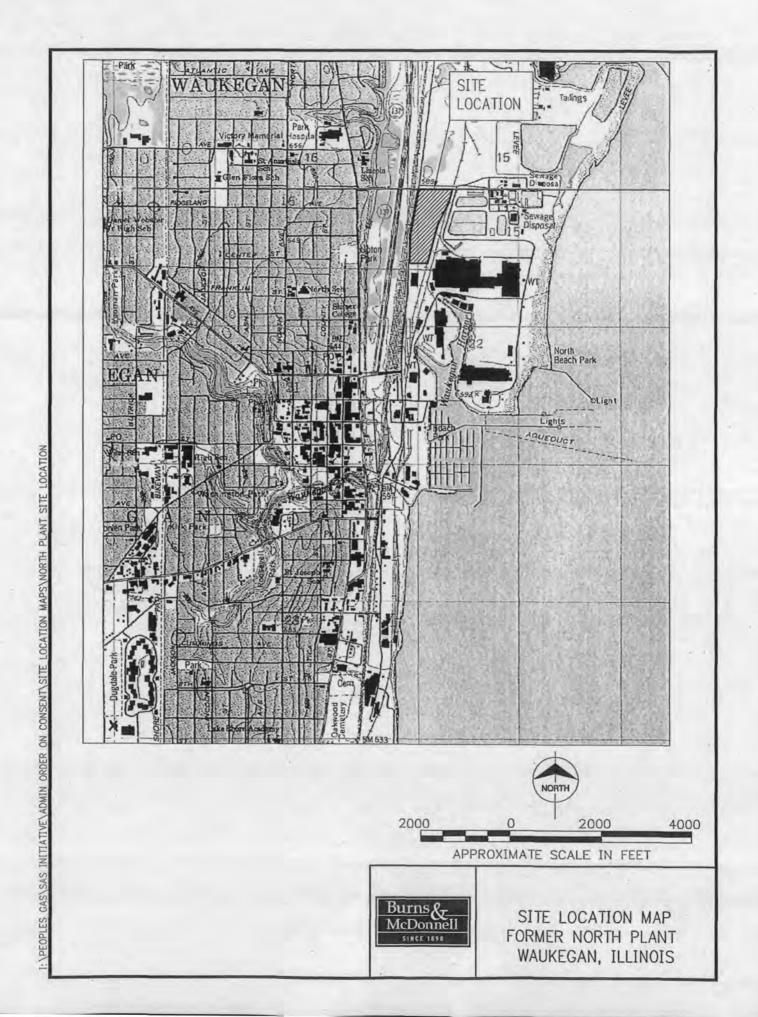
North Plant Manufactured Gas Plant Site Chicago, Cook County, Illinois

It is so ORDERED and Agreed this \underline{B} day of \underline{APRIL} , 2013.

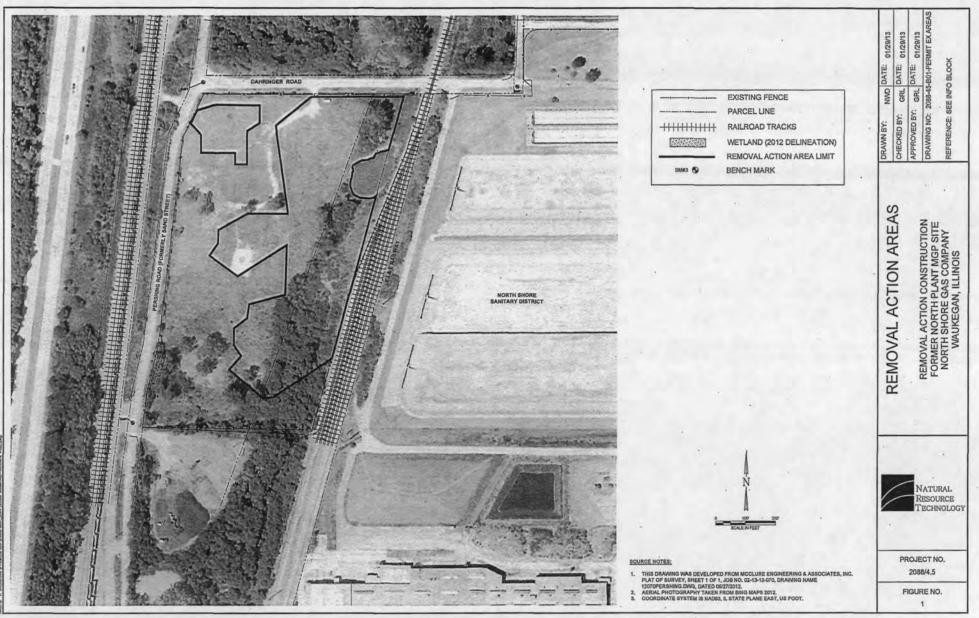
BY:

Richard C. Karl, Director Superfund Division United States Environmental Protection Agency Region 5

APPENDIX 1



APPENDIX 2



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Jon 29, 2015

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APPENDIX 3

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23713 W. PAUL ROAD, SUITE D PEWAUKEE, WI 53072 (P) 262.523.9000 (F) 262.523.9001

ENVIRONMENTAL CONSULTANTS

REMOVAL ACTION WORK PLAN

NORTH SHORE GAS COMPANY FORMER NORTH PLANT MGP SITE WAUKEGAN, ILLINOIS

CERCLA Docket No. V-W-'07-C-877 USEPA (D: ILD984807990 Illinois EPA ID: 0971900063

Project No. 2088

Prepared For:

INTEGRYS BUSINESS SUPPORT, LLC 130 East Randolph Street, 22nd Floor Chicago, IL 60601

Prepared By:

Natural Resource Technology, Inc. 23713 West Paul Road, Suite D Pewaukee, WI 53072

September 21, 2012

Andrew M. Millspaugh, EIT Environmental Engineer

Glenn R. Luke Project Manager/Engineer

WWW.NATURALRT.COM

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ABBREVIATIONS / ACRONYMS

<u>~</u>	
AAC	Acceptable air concentration
ANS	American Nuclear Society
ANSI	American National Standard Institute
Barr	Barr Engineering Co.
BTEX	Benzene, toluene, ethylbenzene, and xylenes
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
COC	Constituents of concern
CQA	Construction quality assurance
DNAPL	Dense non-aqueous phase liquid
FAM	Fixed air monitor
FS	Feasibility study
GGBFS	Ground granulated blast furnace slag
HDPE	High-density polyethylene
HEY	Hey and Associates, Inc.
IAC	Illinois Administrative Code
IEPA	Illinois Environmental Protection Agency
IBS	Integrys Business Support, LLC
ISS	In situ solidification/stabilization
LCSMC	Lake County Stormwater Management Commission
MCL	Maximum contaminant level
MGP	Manufactured gas plant
NAPL	Non-aqueous phase liquid
NPDES	National Pollution Discharge Elimination System
NRT	Natural Resource Technology, Inc.
NSG	North Shore Gas Company
NSSD	North Shore Sanitary District
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photoionization detector
QA	Quality assurance
QC	Quality control
RAWP	Removal action work plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial investigation
RSL	Regional screening level
SI	Site investigation

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ABBREVIATIONS / ACRONYMS

SPLP Synthetic precipitation leaching procedure			
	Synthetic precipitation leaching procedure		
SSWP Site-specific work plan	Site-specific work plan		
SWPPP Storm water pollution prevention plan			
SVOC Semi-volatile organic compound			
TACO Tiered Approach to Corrective Action Object	tives		
TCL Target compound list			
TCLP Toxicity characteristic leaching procedure			
T.E.S.T. Timely Engineering Soil Tests LLC	Timely Engineering Soil Tests LLC		
TPH Total petroleum hydrocarbons	·		
TVOC Total volatile organic compounds			
UCS Unconfined compressive strength			
USEPA United States Environmental Protection Age	ency		
VOC Volatile organic compound	Volatile organic compound		
WDO Watershed Development Ordinance	Watershed Development Ordinance		
WDP Watershed Development Permit			



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1 INTRODUCTION

1.1 Overview

This *Removal Action Work Plan (RAWP)* is for the former North Plant manufactured gas plant (MGP) site in Waukegan, Illinois (Figure 1). North Shore Gas Company (NSG), a subsidiary of Integrys Energy Group, owns the former MGP. Integrys Business Support, LLC (IBS) will manage the removal action on behalf of NSG. NSG and the United States Environmental Protection Agency (USEPA) entered into an Administrative Order on Consent and Statement of Work, CERCLA Docket No. V-W-'07-C-877, effective July 23, 2007, to perform Remedial Investigation/Feasibility Study (RI/FS) activities at two NSG sites under the Superfund Alternative Sites Program.

The North Plant Site is composed of three Parcels (Parcels 1, 2, and 4). The former MGP was located on Parcel 1. Currently, NSG owns Parcels 1 and 2, the City of Waukegan owns Parcel 3, and the EJ&E Railroad owns Parcel 4. This RAWP has been prepared to address residual impacts on Parcels 1 and 2.

Although the RI/FS activities have not been completed, site investigations have identified MGP source material at and near the ground surface that may present an exposure risk. Therefore, this work plan outlines an emergency response (i.e., time critical) removal action to mitigate the exposure risk. The removal action addressed by this RAWP is focused on addressing MGP residuals characterized as source material that pose a potential exposure risk. USEPA concurred via email correspondence dated April 11, 2012 and requested a work plan to conduct a time-critical removal action. On May 22, 2012, USEPA, IBS, and Natural Resource Technology (NRT) reviewed site subsurface conditions and agreed that a removal action including in situ solidification/stabilization (ISS) and focused excavation was appropriate.

This RAWP outlines the scope of the proposed removal action and will serve as the statement of work for a final Administrative Order on Consent between USEPA and NSG pertaining specifically to this removal action.

The removal action is intended as an interim action to address exposed and subsurface MGP source material that will contribute to the overall site remediation goals under the RI/FS Settlement Agreement.



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1.2 Project Information

Regulatory Contact:

United States Environmental Protection Agency Region V Jaime Brown, On-Scene Coordinator 77 West Jackson Boulevard Chicago, IL, 60604

Project Contact:

Integrys Business Support, LLC 130 East Randolph Drive, 22nd Floor Chicago, IL 60601 Naren M. Prasad, P.E., MPH, LEED AP Senior Environmental Engineer (312) 240-4569

NSG Former North Plant MGP Site

T45N, R12E, Section 15 849 Pershing Road Waukegan, Illinois Lake County

ILD984807990

0971900063

USEPA ID #:

Site Name:

Site Location:

Illinois EPA ID:

Environmental Consultant:

NRT Project Contact:

Natural Resource Technology, Inc. 23713 West Paul Road, Suite D Pewaukee, WI 53072

Mr. Glenn R. Luke Environmental Engineer (262) 522-1210

1.3 Site History

According to a report titled *Preliminary Site Investigation, North Plant Site, Waukegan, Illinois,* prepared by Barr Engineering Co. (Barr), dated January 1993, the original parcel of land located at the southeast corner of Dahringer Road and Pershing Road (formerly Sand Street) was purchased by NSG in 1912 from Everett and Elizabeth Millard. According to a report titled *Final Report and Supplemental Extent of Contamination Study, Docket No. V-W-'91-C-115 Waukegan Tar Pit Site,* prepared by Barr, dated February 1994, the former North Plant MGP was constructed and operational by the end of 1912. In 1925, NSG sold a triangular parcel of land along the eastern property line to EJ&E Railroad, who then sold two parcels of land, one triangular parcel in the northeast corner of the property and one parcel near the southern property line, to NSG. In 1975, NSG sold all of its property (inclusive of Parcels 1 and 3) to



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the City of Waukegan, who subsequently sold the northern two-thirds of its property (Parcel 1) to the North Shore Sanitary District (NSSD) in 1982. NSSD also purchased a parcel of land located directly east of the former NSG property (Parcel 2) from EJ&E Railroad in 1982 (Barr 1994). In 2002, NSG re-purchased the portion of the former North Plant and the adjacent property that was owned by the NSSD (Parcels 1 and 2). The southern parcel (Parcel 3) of the former North Plant MGP is owned by the City of Waukegan. EJ&E has owned Parcel 4 since 1925.

The former North Plant MGP operations primarily occurred in the northern, central, and western portions of Parcel 1. The MGP produced gas using a coal carbonization process from 1912 to 1927 when the plant was converted into a carbureted water gas facility. In 1951, the MGP equipment was converted to manufactured oil gas. Manufactured gas production using the oil gas process ceased by 1953. The former MGP also had propane air equipment on site from 1940 through 1965 to meet peak energy demands. By 1965, operations ceased, and the former North Plant MGP was dismantled in stages between 1966 and 1968.

During plant demolition in the late 1960s, a relief holder ruptured and a mixture of water and tar were released to the soil. In response, 25,000 tons of impacted soil was excavated from the Site in 1968. In 1992, the northeast corner of the site referred to as the Waukegan Tar Pit was the subject of a removal action conducted pursuant to a Removal Order issued to NSG by the USEPA. Visual tar was excavated and a high-density polyethylene (HDPE) liner was installed over the excavated pit. Over time, water and sediment has accumulated above the HDPE liner.

1.4 Site Description

The North Plant Site is located at 849 Pershing Road, southeast of the intersection of Pershing Road and Dahringer Road in Waukegan, Lake County, Illinois (Figure 2). The North Plant Site is bounded to the north by Dahringer Road, to the west by Pershing Road, to the east by property owned by the EJ&E Railroad, and to the south by property owned by A.L. Hansen Manufacturing Company. Surrounding land use is shown on Figure 3.

The following terms are used throughout this RAWP and are shown on Figure 2:

- Parcel 1 Currently vacant property owned by NSG where all MGP structures were formerly located (Figure 4). Parcel 1 is bounded by Dahringer Road to the north, Pershing Road to the west, Parcel 2 to the east, and Parcel 3 to the south.
- Parcel 2 Currently vacant property owned by NSG that was never occupied by MGP structures. Parcel 2 is bounded by Dahringer Road to the north, Parcel 1 to the west, and Parcel 4 and EJ&E Railroad to the east. The majority of the Waukegan Tar Pit is on Parcel 2 and wetlands have historically been identified.



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- Parcel 3 Property formerly owned by NSG, now owned by the City of Waukegan, that was never occupied by MGP structures. Parcel 3 is bounded by Parcel 1 to the north, Pershing Road to the west, property owned by A. L. Hansen Manufacturing to the south, and EJ&E Railroad property to the east. The property is currently used by the City of Waukegan for stockpiling yard waste and asphalt grindings.
- Parcel 4 Currently vacant property owned by EJ&E Railroad that contains the remainder of the Waukegan Tar Pit and was never occupied by MGP structures. Parcel 4 is bounded by Dahringer Road to the north, Parcel 2 to the west, and EJ&E Railroad tracks to the east. Beyond the tracks to the east lies the NSSD facility.
- EJ&E Railroad Refers to the active EJ&E Railroad tracks located east of the North Plant Site and west of the NSSD treatment facility.
- North Shore Sanitary District (NSSD) Refers to the active wastewater treatment facility east of the former North Plant Site and EJ&E Railroad.
- Site Areas where impacts to environmental media associated with the Former North Plant MGP are present. At this time these areas include Parcels 1, 2, and 4. No known investigation activities have been conducted on Parcel 3.

1.5 Previous Investigations

Several site investigations (SI) have occurred on the North Plant Site since 1990. Documents associated with the SI activities described below were included as appendices to the USEPA-approved *Site-Specific Work Plan Revision 2* (SSWP), prepared by NRT, and dated November 29, 2011. Historical soil boring and test pit locations are shown on Figure 5. Some of the SI activities were conducted in accordance with the Illinois EPA Site Remediation Program, as defined in Chapter 35 of the Illinois Administrative Code (IAC), Part 740 (35 IAC, Part 740). Soil and groundwater samples were collected, analyzed, and in many cases the results were compared to Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Remediation objectives contained in 35 IAC, Part 742. A contaminant source evaluation was conducted pursuant to TACO, 35 IAC Part 742.305, based on the soil samples analytical results. Each report provides detailed information on specific activities; however, a brief summary is presented below.

1.5.1 Weston, 1990

Site Assessment for Waukegan Tar Pit; Weston, 1990

This report was completed for the USEPA following reconnaissance of the Waukegan Tar Pit by the USEPA Technical Assistance Team. The team observed unrestricted access to a pit of free tar that was covered with water.

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The presence of surface water gave the appearance of a natural pond, which attracted birds and other animals that became trapped by the tar. Free tar and oil was also observed on the ground surrounding the tar pit.

The pit measured approximately 125 by 60 feet. One water sample and two tar samples were collected and analyzed. Laboratory results indicated volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) were present in the water and tar. The flash point for one of the tar samples was below acceptable levels resulting in conditions that warranted an emergency removal action due to actual or potential exposure to hazardous substances and the threat of fire or explosion.

1.5.2 Barr, 1991

Extent of Contamination Study; Waukegan Tar Pit Site; Barr Engineering Company (Barr); May 1991

Barr conducted an Extent of Contamination study from February to March 1991 to laterally and vertically delineate the limits of the tar pit and to identify removal methods in response to the USEPA preliminary assessment.

Sixteen hand auger borings and ten hand probes were advanced within the Waukegan Tar Pit limits to characterize soil and assess the depth of tar. Samples were collected from three locations in the tar pit and were composited into one sample. The tar sample was analyzed for VOCs and SVOCs.

Twenty borings were advanced to further delineate the limits of the tar pit. Two composite soil samples were collected: one north and one south of the tar pit. The samples were analyzed for VOCs, SVOCs, and metals. Additional testing included flashpoint, specific gravity, and BTU content. Select samples were also analyzed for toxicity characteristic leaching procedure (TCLP) metals.

Analytical results indicated elevated levels of VOCs, SVOCs, and metals. Most of the free tar was present within the limits of the tar pit. Tar was found in many of the other borings, but was present as a mixture of tar and sand mostly within the upper 10 feet of the soil.

1.5.3 Illinois EPA, 1992

CERCLA Preliminary Assessment Report; Waukegan Tar Pit; Illinois EPA, 1992

A Preliminary Site Inspection was conducted from September through November 1990. Based on the inspection, the USEPA recommended that the Waukegan Tar Pit be placed on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list and be assigned a high priority status. Surface water and soil contamination were confirmed.



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1.5.4 Barr, 1993

Preliminary Site Investigation: North Plant Site: North Shore Gas Company, Waukegan, Illinois: Barr, January 1993

Barr conducted a preliminary SI to determine if there was a potential for environmental impact at the Former North Plant MGP. The preliminary SI concluded that chemicals associated with past MGP operations may be present in surface soils. No sampling was conducted as part of this event.

1.5.5 Barr, 1994

Final Report and Supplemental Extent of Contamination Study, Docket No. V-W-'91-C-115, Waukegan Tar Pit Site: North Shore Gas Company, Barr, January 1994

In August 1992, Barr conducted a Supplemental Extent of Contamination Study at the Waukegan Tar Pit under Administrative Order, Docket Number V-W-'91-C-115, pursuant to Section 106 of CERCLA (Section 106 Order). The Waukegan Tar Pit was excavated on January 10, 1992 and covered with an HDPE cover. The removal action was conducted to "remove all visible free tar" (i.e., tar that is not mixed with any soil or other foreign material) from the tar pit.

Notable observations from the study include the following:

- Free tar within the pit ranged from 1 to 3.5 feet thick.
- An estimated 67,000 cubic yards of soil that contain tar remained in the vicinity of the tar pit extending to a depth of approximately 26 feet.

In addition to documenting the removal action specified in the Section 106 Order, 66 soil borings were advanced, 5 groundwater monitoring wells were installed, 54 soil samples were collected and analyzed for VOCs and polycyclic aromatic hydrocarbons (PAH), and several rounds of groundwater samples were collected and analyzed for VOCs, PAHs, and inorganics. Free tar was identified in the northeast portion of the Site (Parcels 1 and 2) and on the property immediately east of the Site based on visual observation.

Chlorinated compounds (including trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,2-dichloroethene (DCE), 1,1-dichloroethane (DCA), and vinyl chloride) were detected in soil samples along Dahringer Road (i.e., borings B47, B47A, and B48A). The soil samples were collected below the water table between 8 and 16 feet below ground surface (bgs). Chlorinated compounds were not detected in samples from the tar pit and Barr concluded that their presence was unrelated to tar migration and is likely from and off-site source.



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1.5.6 Dames & Moore, 1995

Site Investigation Report of the Waukegan Tar Pit and the North Shore Gas Company, Dames & Moore, September 1995

Dames & Moore was retained by the EJ&E Railroad and conducted an SI in September 1995. The SI included a geophysical survey to locate former MGP structures and the advancement of 16 soil borings to collect soil samples for visual characterization, lithology, and chemical analyses. Fifteen soil samples were collected and analyzed for VOCs and SVOCs. Tar was identified in the northeast, northwest, and central portions of the Site based on visual characterization and laboratory analyses. Samples indicated dense non-aqueous phase liquid (DNAPL) was present in borings centrally located on the Site.

1.5.7 Burns & McDonnell, 2005

Comprehensive Site Investigation, Former North Plant Manufactured Gas Plant Operational Area and Adjacent Property, Waukegan, Illinois; North Shore Gas Company; Burns & McDonnell, November 2005, (CSI Report, Burns & McDonnell 2005)

Burns & McDonnell conducted a source delineation SI in July and August 2002 and a comprehensive SI on Parcels 1 and 2 from July through September 2004. The objectives of the SI were to delineate the extent of previously identified tar and other contaminants and determine if there is a threat to human health and the environment.

During the August 2002 SI, 61 soil borings and 16 test pits were advanced. During the 2004 SI, 27 soil borings, 54 soil probes, and 23 test pits were advanced. Fourteen of the soil borings were converted into groundwater monitoring well nests screened at varying depth intervals within the same unconfined waterbearing unit. Soil samples were analyzed for target compound list (TCL) VOCs, TCL SVOCs, priority pollutant metals, and total cyanide. Select samples were additionally analyzed for TCLP Resource Conservation and Recovery Act (RCRA) metals, synthetic precipitate leaching procedure (SPLP) metals, polychlorinated biphenlys (PCB), reactive cyanide, reactive sulfide, flashpoint, total petroleum hydrocarbons (TPH), and soil pH for waste characterization purposes. Groundwater samples were collected once from monitoring wells and samples were analyzed for TCL VOCs, TCL SVOCs, priority pollutant metals, and amenable cyanide.

Contaminant source material in the form of tar, tarry residue, or related sheen was identified based on visual observation and analytical results. Tar was identified on the surface in portions of the Site and in one groundwater monitoring well nest. Chlorinated VOCs, which are not associated with former MGP operations, were identified in the northeast portion of the Site and are believed to be associated with



former industrial operations located north of the Site. Five areas of concern were identified as the following:

- The northeast portion of the Site near the Waukegan Tar Pit.
- The eastern and southeastern portions of the Site along the EJ&E railroad tracks.
- The northwest portion of the Site, including the area of the former aboveground gas holder, tar wells, and generator house.
- The center of the Site near the former purifying room, purifier house, aboveground tar tank, and coke bins.
- The southwest portion of the Site north of a former tar pit structure.

1.6 Previous Actions

Previous actions at the Site include the following:

- <u>Activities associated with plant decommissioning in 1968</u>: During plant decommissioning, a relief holder ruptured and released a mixture of water, tar emulsion, and tar to the soil. Approximately 25,000 tons of tar was excavated from an area of approximately 300 by 10 feet. No other details regarding this rupture and excavation are available.
- Free tar removal from the Waukegan Tar Pit in 1991: Executed pursuant to a CERCLA Removal Action Order. The objective was to remove all visible tar from the Waukegan Tar Pit. Six inches of water was removed from the pit, treated, and discharged into an NSSD sanitary sewer. The depth of tar that was removed ranged from approximately 3 to 6 feet bgs. An HDPE liner was installed and approximately 19,000 gallons of water was placed on top of the liner to hold it in place.
- Limited excavation activities in 2003: Excavation occurred in the central portion of the Site in one of the five areas identified in 2002. Excavation activities were conducted in the central portion of Parcel 1 in an area where several aboveground oil tanks were formerly located. Approximately 1,700 tons of excavated material was managed as non-hazardous special waste. The excavation extended to the water table and the area was subsequently backfilled with imported, clean granular material. The excavation was suspended because of potential litigation issues with other potentially responsible parties.

NATURAL RESOURCE TECHNOLOGY

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2 SUMMARY OF SITE CONDITIONS

2.1 Site Geology and Hydrogeology

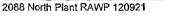
Based on SI activities conducted by Burns & McDonnell, site geology was characterized through the advancement of soil probes/borings and test pits. The unconsolidated materials identified at the Site consist of silty clay overlain by sand and fill material. Bedrock was not encountered during the SI activities. Geotechnical testing was conducted and the soils were classified. The identified soils are described as follows:

- Fill Unit The fill unit is primarily sand with lesser amounts of gravel, cinders, gypsum, brick fragments, and wood fragments. The fill unit generally ranged from 3.5 to 11 feet thick with an average thickness of approximately 7 feet.
- Sand Unit Underlying the fill unit is the native sand unit that is primarily olive gray to light olive gray medium to fine-grained sand. The top of the sand unit was generally encountered at depths ranging from 3.5 to 11 feet bgs with an average thickness of 17 feet. In two soil borings/probes, SB36 and SP157, the top of the sand unit was encountered at depths of approximately 12 and 15 feet bgs, respectively.
- Silty Clay Unit Underlying the sand unit is the silty clay unit that is olive gray to light olive gray, hard to very hard, low plasticity, moist silty clay. This unit serves as a low-permeability barrier directly beneath the sand layer. The clay unit was encountered in soil borings and probes advanced across the Site except where shallow refusal was encountered. The top of the clay unit was encountered at depths ranging from 18.5 to 29 feet bgs.

The sand unit functions as the main water-bearing unit at the Site and groundwater is encountered at about 3 to 7 feet bgs. Recharge of groundwater in the fill, sand, and silty clay units are expected to occur locally and are presumed to be affected by infiltrating precipitation. The porous nature of the upper fill and sand units allow for adequate percolation into the subsurface. Slug tests performed during past investigations indicate the hydraulic conductivity of the silty sand unit is approximately 5.66 x 10^{-3} cm/s.

2.1.1 Site Topography and Drainage

The closest surface water body to the Site is the North Ditch that lies approximately 800 feet to the east southeast. Surface water bodies near the Site include Waukegan Harbor, (approximately 2,000 feet southeast) and Lake Michigan (approximately 3,000 feet east). Natural surface water runoff is primarily influenced by local topography. There are no storm sewer inlets located on the Site. There are no buildings or paved areas on the Site, and the ground surface consists mainly of grass and gravel.





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According to the Federal Emergency Management Agency Flood Insurance Rate Map, the Site is not within the limits of the 100-year floodplain. The Illinois Department of Conservation's Natural Heritage Database lists no federal or state threatened and endangered species or pristine natural areas located within the Site boundaries.

A portion of the former Waukegan Tar Pit is located within Parcel 2, and previously defined wetlands were located within Parcels 1, 2, and 4. Historically, a wetlands jurisdictional determination, wetland delineation, and wetland concurrence were performed and approved on the property. On October 15, 2001, the U.S. Army Corps of Engineers provided jurisdictional determination for the property; the wetlands were considered isolated and did not require a permit from the Corp. The jurisdictional determination was valid for 5 years. A Wetlands Delineation Report was prepared for the Site in October 2003 (Burns & McDonnell, 2003). A Wetland Boundary Verification submittal was prepared by Burns & McDonnell in July 2004 to supplement the Wetlands Delineation Report. Four wetlands were identified at the Site. Three wetlands designated as high guality were located on the eastern portion of the Site and one low quality wetland was located along the western Site boundary. According to the National Wetland Inventory map developed by the US Fish and Wildlife Service, a Palustrine Open Water/Unknown Bottom Semipermanently Flooded wetland area is located on the northeast portion of the Site. Burns & McDonnell conducted further wetland delineation on the Site at the direction of the Lake County Stormwater Management Commission (LCSMC). Three wetland areas were revised by Burns & McDonnell and were approved by a wetland specialist from LCSMC through correspondence addressed to Burns & McDonnell, dated August 16, 2004. The wetland delineation approval was valid for three years. Subsequent wetland delineations and permitting were initiated in May 2012, as described in Section 5.2.

2.2 Pre-Removal Site Characterization Activities

Pre-removal site characterization activities were completed during the weeks of April 23, June 18, June 25, and July 2, 2012. The activities included soil borings and test pit excavations to achieve the following objectives:

- Refine the proposed removal action excavation areas shown on Figures 6 and 7
- Verify subsurface observation and analytical data from previous investigations indicating the presence of source material
- Assess the presence of former MGP foundation structures and/or debris in the removal action areas



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- Characterize phases of MGP impacts found
- Characterize the subsurface fill for excavatability considerations including side slope stability
- Characterize material for waste disposal
- Assess the dewatering conditions and presence or absence of non-aqueous phase liquid (NAPL)
- Assess odors and air quality conditions to prepare for fugitive emission controls during fullscale removal actions

During the week of April 23, 2012, three soil borings (SB200, SB201, and SB202) and nine test pits were advanced on the Site. Challenging subsurface conditions, including shallow water table and sandy soil, limited the success of advancing soil borings using direct-push drilling methods (i.e., Geoprobe[®]). Soil borings could not be advanced to target depths for complete site characterization and the investigation was stopped. Two soil samples, from SB200 and SB201, were collected for TPH analysis and source area delineation.

Nine test pits (TP3 through TP11) were excavated while alternate drilling methods were evaluated for completing the site characterization activities. The excavated test pits yielded the following observations of subsurface conditions:

- Former MGP foundation structures and/or debris are present in the removal action areas.
- Various phases of MGP impacts are present in each of the removal areas.
- The groundwater table is present at shallow depths ranging from 2 to 5 feet bgs. The combination of shallow water and high permeability soil conditions produced unmanageable amounts of groundwater infiltration into the test pits and prevented accurate assessment of subsurface soils and representative soil sampling below the water table.
- Shallow groundwater, granular subsurface fill, and sandy soils contributed to unstable, challenging, and potentially unfeasible excavation conditions to the depths required for a removal action. Test pit excavations filled with groundwater and could not be advanced deeper than approximately 15 to 18 feet bgs.

Soil samples were not collected during the test pit investigation. One water sample was collected from TP4 for representative excavation dewatering conditions and potential treatment and discharge during construction. The water sample was analyzed for PCBs, dissolved metals, dissolved mercury, SVOCs, VOCs, dissolved kieldahl nitrogen, and total phosphorus.

Subsurface conditions observed during test pit excavation resulted in re-evaluation of removal approaches for the Site. IBS and NRT presented the observed conditions and removal alternatives to the



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USEPA in a meeting on May 22, 2012. At this meeting, the USEPA agreed that the conditions warranted evaluation of a remedy that included excavation in combination with ISS, as further discussed in Sections 3 and 4.

Site characterization activities resumed during the week of June 18, 2012. A combination of hollow-stem auger and mud-rotary drilling techniques were used to complete 31 soil borings (SB203 through SB229) for collection of subsurface observational and analytical data. Soil borings were advanced to the silty clay unit with depths ranging from 19 to 25 feet bgs. Geologic observations were consistent with historically complete soil borings with the fill, sand, and clay units observed as described in Section 2.1. Thirteen soil samples were collected from discrete intervals for laboratory analysis for TPH via Method 8015B gasoline and diesel range organics. Analytical results are summarized in Table 1 and were used to verify the presence of source material from previous investigations and refine removal action area extents.

Soil boring and test pit locations are shown on Figure 5. Analytical reports and completed soil boring logs are provided in Appendix A1 and A2, respectively.

2.3 Existing Utilities and Site Constraints

2.3.1 Existing Utilities

Utility mapping has identified aboveground and underground utilities near the site boundaries. The identified utilities are shown on Figure 2. A private utility locate was performed on and surrounding the Site on March 27, 2012. The private utility locate did not identify any additional active utilities within or near the site boundaries other than those shown on Figure 2.

Identified utilities include the following:

- Sanitary Sewers: Sanitary sewers ranging in size from 10-inch to 54-inch exist along Pershing and Dahringer Roads in the Right-of-Way. Two sanitary sewers (54-inch and 48-inch) cross the Site in the southern portion of Parcels 1 and 2, and one 54-inch sanitary sewer crosses the Site in the northern portion of the parcels. Based on the current removal action plan, these utilities are outside of the proposed work area and will not be affected.
- <u>Water Mains</u>: 10-inch and 16-inch water mains exist along Pershing and Dahringer Road in the Right-of-Way. These utilities are outside of the Site and will not be affected by removal action activities.



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- Overhead Utilities: Overhead utilities exist along Pershing Road and Dahringer Road outside of the site boundaries. Additional overhead utilities exist along the EJ&E Railroad east of the Site within Parcels 4 and 2. Overhead utilities that exist in Parcel 2 may require coordination with the utility provider to support, relocate, or remove the utility prior to or during removal action activities. This utility crosses the planned removal action area on Parcel 2.
- <u>Gas Utilities</u>: A gas line exists along Dahringer Road in the Right-of-Way. This utility is
 outside of the Site and will not be affected by removal action activities.

2.3.2 Site Constraints

As noted in Section 1.4, Parcels 1 and 2 are currently owned by NSG, Parcel 3 by the City of Waukegan, and Parcel 4 by the EJ&E Railroad. This RAWP addresses residual impacts on Parcels 1 and 2 currently owned by NSG. Site constraints that will limit the extents of proposed removal action include the following:

- Parcel 4: At this time, NSG does not have an access agreement with the EJ&E Railroad to access Parcel 4.
- Former Waukegan Tar Pit: The existing water impoundment created as a result of the free tar removal from the Former Waukegan Tar Pit exists on both Parcels 2 and 4. Due to technical feasibility and impracticality of removing only a portion of the lined water impoundment without access to Parcel 4, this area of Parcel 2 will not be addressed during the removal action. Further investigation of the pond liner anchor trench and a geotechnical investigation may be required to determine an appropriate offset from the pond for removal action area limits.
- <u>Railroads:</u> The removal action will address residual impacts up to the eastern property boundaries with the EJ&E Railroad and Parcel 4, to the extent practical and allowable.
- <u>Roads</u>: The removal action will address residual impacts up to Pershing Road and Dahringer Road Right-of-Ways as needed and to the extent practical and allowable.

2.4 Soil Data Compilation and Interpolation

Prior and new site boring logs, field observations, and analytical data were compiled and summarized to evaluate potential source material and delineate removal action areas as part of the removal action planning.

Proposed removal action limits were primarily defined based on descriptions of visual NAPL identified as MGP source material as described in Section 3.2. Soil analytical data were used to correlate visual indicators of NAPL. The proposed removal action areas were verified and refined to include areas where TPH concentrations exceeded the default value of 2,000 mg/kg in accordance with TACO regulations for



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determination of soil attenuation capacity (Illinois TACO: 35 IAC 742, Section 742.215). TPH was assumed to be representative of the primary constituents of concern (COC) including benzene, toluene, ethylbenzene, xylenes (BTEX), and total PAHs. The visual descriptions of NAPL and associated analytical data were used to delineate lateral and vertical extents of source material in soil boring locations. This approach is consistent with the USEPA-approved time-critical removal action at Crawford Station Parcels A, B, and O, Chicago, Illinois.

2.5 Characterization of Material for Disposal

Excavated MGP-impacted debris and soil will be disposed at Countryside Landfill, located in Grayslake, IL, a Subtitle D landfill. Countryside is approved by the USEPA with respect to the Off-Site Rule as set forth in the National Contingency Plan in 40 CFR 300.440. Soil and debris disposal will be in accordance with the existing Waste Management Profile Number EF 1496 (Appendix E).

Analytical results from several historical samples collected in the proposed removal areas indicate that TCLP benzene concentrations may be greater than 0.5 mg/L, the allowable limit based on Illinois' Subtitle D solid waste landfill permit criteria. However, these discrete samples, with the exception of one, were collected at depths that are targeted for ISS. Any soil that may exhibit benzene concentrations greater than 0.5 mg/L will be managed on site and remediated with ISS.

Under applicable Illinois regulations (Title 35, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter c: Hazardous Waste Operating Requirements, Section 721) TCLP analysis for benzene at MGP sites is exempt from toxicity characteristic requirements.

2.6 Risk to Public Health, Welfare or the Environment

Site soil analytical data for constituents of concern including VOCs, SVOCs, PAHs, and metals are presented in the SSWP (NRT, November 2011). Soil analytical data are compared to screening levels following the hierarchical approach identified in the USEPA-approved Risk Assessment Framework (Exponent, September 2007). The screening levels are a combination of USEPA Regional Screening Levels (RSLs) and Illinois TACO Tier I values.

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Compared to factors in the National Contingency Plan Section 300.415(b)(2), conditions at the Site may present an imminent risk to public health, welfare, and the environment. Selected factors that are applicable to this determination include the following:

- 1. <u>Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants</u>
 - No active operations are conducted in the vicinity of exposed MGP residuals. Typical security measures, including fencing, are employed to limit access to exposure.
 - A potential exposure risk exists from MGP residuals at ground surface as shown on Figure 2. Subsurface contaminant migration is a potential threat to additional receptors.
- 2. Elevated levels of hazardous substances or pollutants or contaminants in soils at or near the surface that may migrate
 - MGP residuals meeting the classification of source material were identified at the ground surface. The MGP residuals exhibit elevated concentrations of PAHs and VOCs.

Given the site conditions, the nature of known and suspected hazardous substances, and the potential exposure pathways, actual or threatened releases of hazardous substances, pollutants, or contaminants are evident. ISS and excavation of MGP source materials will mitigate the direct contact exposure pathway and reduce the potential for migration to soil, groundwater, or surface water. If not addressed by implementing this removal action, the site conditions will continue to be a risk to public health, welfare, or the environment.



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3 BASIS FOR REMOVAL ACTION

3.1 Removal Action Objectives and Strategy

The objectives for the removal action include the following:

- Immobilize and/or remove identified MGP source material within the defined removal action areas and eliminate residual MGP residuals at the surface and associated direct contact concerns to the extent practicable.
- Immobilize and remove other materials from the Site that may be impacted by MGP residuals, but are not considered source material, on a selective basis to support long-term site management within the Multi-Site Framework and avoid future remediation below or immediately surrounding the removal areas.
- 3. Restore the Site by replacing removed material with clean fill and construction of a clean soil cover over the stabilized material.

The removal action was developed with the following strategy:

- Select a removal strategy that can be feasibly and economically implemented within a short timeframe.
- Use a planning and design process that addresses MGP source material defined by prior investigations and verified by pre-removal site characterization.
- Limit the removal action scope to areas of the Site where immediate implementation is feasible considering issues such as property ownership, access constraints, and practical considerations.

The selected removal action strategy includes a combination of ISS, shallow soil excavation and landfill disposal, including removal of historical structures. In the event that obvious non-MGP contamination is evident during the removal action (e.g., buried drums, previously unidentified underground storage tanks, or other types of impacts that are visually distinct from the MGP source material) appropriate procedures will be employed to address the contamination in accordance with federal, state, and local requirements. As appropriate, the USEPA On-Scene Coordinator will be promptly notified. If the type of contamination encountered is not consistent with site investigation data or the site waste profile, supplemental sampling and waste characterization may be performed to ensure proper management, handling, and/or disposal of the material.



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3.2 MGP Source Material Definition

As a time-critical removal action, the proposed work is proceeding without a complete RI/FS or quantitative risk assessment. To accomplish project objectives, the removal action relies on investigative visual assessment methods supplemented with soil sampling and analysis. This is consistent with USEPA-approved approaches at other sites in Region 5 such as the time-critical removal action at Crawford Station Parcels A, B, and O, Chicago, Illinois. The removal action at Crawford Station is being performed in general accordance with *Removal Action Work Plan Revision 1*, prepared by NRT and dated September 6, 2011. Soils exhibiting visual NAPL conditions described below and/or having TPH concentrations exceeding the default value of 2,000 mg/kg in accordance with Illinois TACO regulations for determination of soil attenuation capacity (Illinois TACO: 35 IAC 742, Section 742.215) are considered source material. Areas exhibiting lesser degrees of NAPL that do not meet the source definition (e.g., tar or oil staining in clay fractures) will not be considered MGP source material.

MGP source material that will be addressed and has been visually identified is defined as follows:

Descriptive Termin	Soil boring log descriptions the from prior investigation work.	(Definition
Tar at ground surface	Tar at surface	Areas where tar is visible at the ground surface
Oil Wetted	Tar saturated Free product	Visible brown or black oil wetting the soil sample. Oil appears as a liquid and is not held by soil grains.
Oil Coated	Tar coated, Oily, Hard tar	Visible brown or black oil coating soil particles. Typically associated with coarse-grained soil such as coarse sand, gravel, and cobbles.

MGP Source Material Description

3.3 Removal Action Decision Criteria

The following decision criteria will be applied to the removal action:

Removal/ISS of MGP source material from 0 to 4 feet bgs to mitigate the direct contact exposure pathway. If groundwater is encountered, soil excavation may be terminated prior to reaching a depth of 4 feet bgs. Soil excavation may extend deeper than 4 ft and laterally outside of removal areas to remove subsurface MGP structures (e.g., foundations and piping) as shown on Figure 6.



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- ISS of MGP source material to depths of up to 10 feet bgs to mitigate potential exposure to future construction workers and migration to soil and groundwater.
- ISS of MGP source material to depths greater than 10 feet bgs to support long-term site management within the Multi-Site Framework and avoid future remediation below or immediately surrounding the removal action areas. Based on available data, the greatest planned depth of the removal action is approximately 25 ft bgs.

Following shallow soil excavation and removal of subsurface MGP structures (e.g., foundations and piping), MGP source material within the delineated removal action areas will be solidified by ISS. Completed ISS will be sampled for verification that specifications and design parameters are achieved. Construction guality assurance (CQA) details are described in Sections 4 and 6.

3.4 Estimated Removal Action Volume

The approximate lateral and vertical excavation extents of MGP source material removal action areas and volumes associated with each are presented on Figures 6 and 7. Removal action areas include the following:

- Area A: Includes portions of Parcels 1 and 2, an area delineated with tar at the surface near the former tar pit area, and the eastern portion is within the footprint of the former MGP and will likely include subsurface MGP structures. Source material impacts are generally considered to be at or near ground surface and extend to near the clay surface at approximately 20-25 feet bgs. Removal action in Area A is planned to include the following:
 - <u>Excavation (Area A)</u>: Excavation will include removal and off-site disposal of the top 4 feet of soil including all subsurface foundations and structures. Excavation will be extended to depths beyond 4 feet bgs as necessary to remove subsurface structures and debris. The volume of material estimated for excavation and off-site disposal is 25,760 cubic yards.
 - <u>Tar at Surface (Area A1)</u>: MGP source material in this area will be excavated and relocated for management on site with ISS. Excavation will include relocation of the top 4 feet of soil. The volume of material estimated for excavation, relocation, and management with ISS is 3,725 cubic yards.
 - <u>ISS (Area A)</u>: ISS will include solidification/stabilization of MGP source material from 4 feet bgs to the clay surface at approximately 25 feet bgs. The volume of material estimated for ISS is 154,780 cubic yards.
- Area B: Includes portions of Parcels 1 and 2. Source material impacts are generally considered to be at or near ground surface and extend to a depth of approximately10 feet bgs. Limited areas include source material deeper than 10 feet. Removal action in Area B is planned to include the following:



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- <u>Excavation (Areas B, B1, B2)</u>: Excavation will include removal and off-site disposal of the top 4 feet of soil including any subsurface foundations and structures. Excavation will be extended to depths beyond 4 feet bgs as necessary to remove subsurface structures and debris. The volume of material estimated for excavation and off-site disposal is 17,040 cubic yards.
- <u>ISS (Area B)</u>: ISS will include solidification/stabilization of MGP source material from 4 feet bgs to 12 feet bgs. As described in Section 4.4.5.1, ISS will be extended 2 feet below identified source material in areas where source material impacts do not extend to the clay surface. The volume of material estimated for ISS is 30,200 cubic yards.
- <u>ISS (Area B1)</u>: ISS will include solidification/stabilization of MGP source material from 4 feet bgs to the clay surface at approximately 24 feet bgs. The volume of material estimated for ISS is 1,185 cubic yards.
- <u>ISS (Area B2)</u>: ISS will include solidification/stabilization of MGP source material from 4 feet bgs to the clay surface at approximately 24 feet bgs. As described in Section 4.4.5.1, ISS will be extended to the clay surface at the perimeter of areas not targeted for ISS to the clay surface. The volume of material estimated for ISS is 8,510 cubic yards.
- Area C: Located on Parcel 1 within the footprint of the former MGP and will likely include subsurface MGP structure. Source material impacts are generally considered to be near ground surface and extend to and average depth of approximately 13 feet bgs. Limited areas include source material deeper than 13 feet. Removal action in Area C is planned to include the following:
 - Excavation (Areas C, C1, C2, C3): Excavation will include removal and off-site disposal of the top 4 feet of soil including any subsurface foundations and structures. Area C1 includes excavation only of the top 5 feet of soil. Excavation will be extended to depths beyond 4 or 5 feet bgs as necessary to remove subsurface structures and debris. The volume of material estimated for excavation and off-site disposal is 4,510 cubic yards.
 - <u>ISS (Area C)</u>: ISS will include solidification/stabilization of MGP source material from 4 feet bgs to 15 feet bgs. As described in Section 4.4.5.1, ISS will be extended 2 feet below identified source material in areas where source material impacts do not extend to the clay surface. The volume of material estimated for ISS is 8,285 cubic yards.
 - ISS (Area C2): ISS will include solidification/stabilization of MGP source material from 4 feet bgs to the clay surface at approximately 24 feet bgs. The volume of material estimated for ISS is 1,430 cubic yards.
 - <u>ISS (Area C3)</u>: ISS will include solidification/stabilization of MGP source material from 4 feet bgs to the clay surface at approximately 24 feet bgs. As described in Section 4.4.5.1, ISS will be extended to the clay surface at the perimeter of areas not targeted for ISS to the clay surface. The volume of material estimated for ISS is 4,675 cubic yards.



The total volume of material to be addressed during the removal action is to be **260,100 cubic yards**; including **212,790 cubic yards** of ISS and **47,310 cubic yards** of excavation and off-site disposal. The volume of material excavated and disposed off site may be increased if subsurface MGP structures extend beyond the delineated removal area limits, as described in Section 4.4.1.1.

3.5 In Situ Solidification/Stabilization Treatability Study

A bench scale/treatability study for ISS, initiated in June 2012, is currently being performed by Timely Engineering Soil Tests LLC (T.E.S.T.) to develop a basis for design of ISS as the remedial technology. Results of the study available to date are presented in Appendix B. A Final ISS Treatability Study Report will be submitted under separate cover when the test is complete in October 2012.

Objectives for the study include the following:

- Develop an ISS mix design capable of stabilizing/solidifying MGP residuals, and designed to enhance protection of human health and the environment
- Develop an economical mix design for implementing ISS using locally available reagents
- Assess the physical and chemical properties of stabilized/solidified materials
- Assess the volumetric expansion associated with ISS
- Demonstrate the solidified monolith will provide suitable geotechnical conditions for future property development

3.5.1 ISS Design Goals

Physical and chemical ISS design goals for the treatability study include the following:

- Unconfined Compressive Strength (UCS) (ASTM D1633): ≥ 50 psi
- Hydraulic Conductivity (ASTM D5084): $\leq 1 \times 10^{-6}$ cm/s
- Durability (Freeze/Thaw) (ASTM D4842): Weight loss < 15%
- Durability (Wet/Dry) (ASTM D4843): Weight loss < 15%
- Slake (Submergence Testing): Minimal deterioration, minimal discoloration of water (No Phase Separated Tar or Oil)
- Volumetric Expansion: < 30% of targeted treatment zone if possible
- Leach Testing (ANSI/ANS 16.1): Less than the design goals established in Table 3. Design goals are established for site COCs and are based on USEPA maximum contaminant level (MCL), IEPA TACO Tier 1, or USEPA regional screening level (RSL) as established by multi-site screening levels (June 2012) based on the May 2012 update to the EPA RSLs.



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Full-scale ISS implementation will create a stable and relatively impermeable monolith by reducing the hydraulic conductivity of the subsurface relative to the surrounding soil to ultimately preventing leaching. Slug tests performed during past investigations indicate the hydraulic conductivity of the silty sand unit at the Site is 5.66 x 10⁻³ cm/s. The established design goal of 1 x 10⁻⁶ cm/s will provide orders of magnitude difference in hydraulic conductivity between the monolith and surrounding soils, reducing the flow of groundwater through the monolith and reducing leaching of contaminant from the stabilized/solidified source material. Design goals were developed with reference to the USEPA's *Technology Performance Review: Selecting and Using Solidification/Stabilization Treatment for Site Remediation* (EPA/600/R-09/148 November 2009) and ITRC's Technical/Regulatory Guidance *Development of Performance Specifications for Solidification/Stabilization*, prepared by the Interstate Technology & Regulatory Council Solidification/Stabilization Team, July 2011. The methodology for evaluating the physical design goals is based on appropriate ASTM standards or qualitative analysis (e.g., slake testing).

To evaluate leach test design goals, concentrations of COCs are evaluated from leachate samples. Since the application of ISS will result in a solid mass, a leach test that submerges an undisturbed monolithic column in demineralized water will be performed during the treatability study. American Nuclear Society (ANSI/ANS) Method 16.1 leachability test method will be used to evaluate leachate at the intervals presented in Table 3 for each mix design selected for leach testing.

3.5.2 Design of ISS Treatability Study

Based on industry and NRT's experience with ISS treatability studies and remediation at similar MGP sites, three mix designs containing the following reagent regimens (percentage by dry mass of soil) were developed for testing:

Cement/Ground Granulated Blast Furnace Slag (GGBFS) Mixes

- Mix 1 6% Total Cement-based Reagents Cement: 1.5% and GGBFS: 4.5%
- Mix 2 8% Total Cement-based Reagents Cement: 2% and GGBFS: 6%.
- Mix 3 10% Total Cement-based Reagents Cement: 2.5% and GGBFS: 7.5%.

Cement/Bentonite Mixes

- Mix 4 8% Total Cement-based Reagents Cement; 8% and Bentonite: 0.5%.
- Mix 5 10% Total Cement-based Reagents Cement: 10% and Bentonite: 0.5%.



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- Mix 6 8% Total Cement-based Reagents Cement: 8% and Bentonite: 1.0%.
- Mix 7 10% Total Cement-based Reagents Cement: 10% and Bentonite: 1.0%.

Cement/GGBFS/Bentonite Mixes

- Mix 8 6% Total Cement-based Reagents Cement: 1.5%; GGBFS: 4.5%; Bentonite: 0.5%.
- Mix 9 8% Total Cement-based Reagents Cement: 2%; GGBFS: 6%; Bentonite: 0.5%.
- Mix 10 10% Total Cement-based Reagents Cement 2.5%; GGBFS: 7.5%; Bentonite: 0.5%.

Laboratory batch worksheets for each of the mixes prepared are provided in Appendix B1. Material data sheets and mill test reports for the cement and GGBFS (LaFarge) and bentonite (Bara-Kade[®] 30 Mesh) are provided in Appendix B2.

To evaluate the mix designs for performance versus the ISS design goals, the ISS treatability study was completed in accordance with the following procedures:

- Soil Collection: NRT collected soil samples from four test pits excavated in each of the proposed removal action areas on June 8, 2012. The samples were collected to be characteristic of soil conditions that will require ISS the removal action. Collected samples were composited into eight 5-gallon buckets for ISS treatability testing and were shipped to T.E.S.T.
- Initial Characterization: Upon arrival at the T.E.S.T., the soil types in each bucket were classified (ASTM Method D2487) to verify relative consistency of soil type. The soils were composited into one representative sample for chemical and physical testing prior to mixing for the ISS study. Physical testing parameters included moisture content, modified bulk density, particle size analysis, and Atterberg Limits. A summary of the treatability study physical tests is provided in Table 2. Chemical analysis was performed for the site COCs. Analytical and geotechnical testing reports are provided in Appendix B3 and B4.
- Initial Mix Design Testing: ISS sample molds were created for all tests, including initial testing and final mix design testing, for each reagent regimen (Mix 1 through 10). Each mix was tested for moisture content prior to sample curing.
 - <u>Phase I Testing</u>: Mixes 2, 5, 7, and 9 were tested as baseline reagent percentage additions for UCS, hydraulic conductivity, and moisture content after curing intervals of 7 days, 14 days, and 28 days. Pocket penetrometer readings were also performed each day after the third day of curing until the maximum reading was reached.
 - <u>Results Analysis</u>: NRT evaluated the Phase I UCS and hydraulic conductivity test results to optimize mix selection for Phase II Testing. Phase II Testing was designed to evaluate a mix design's ability to achieve the permeability design goal while controlling strength to allow for possible future excavation.



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- <u>Phase II Testing</u>: Mixes 2 and 9 achieved the design goals for UCS and hydraulic conductivity in Phase I testing. To evaluate and optimize the mixes, Mixes 1 and 8 were selected for Phase II Testing for UCS and hydraulic conductivity. Mixes 1 and 8 are comprised of same components as Mixes 2 and 9, respectively, but at lower percentages.
- Final Mix Design Testing: Phase II Testing results indicated that both Mixes 1 and 8 achieved the design goals for UCS and hydraulic conductivity. Mixes 1 and 2 were selected for final testing since these mixes achieved the design goals and had fewer material components (i.e., do not include bentonite) than Mixes 8 and 9. Final testing includes wet/dry durability, freeze/thaw durability, slake, ANSI/ANS 16.1 leach testing, and volume expansion.

Initial characterization and initial mix design testing (Phases I and II) are complete. Final mix design testing results will be compiled and included under separate cover with a Final ISS Treatability Study Report upon test completion in the fall 2012.

3.5.3 Summary of ISS Treatability Study Results

Mix Designites	Marchaeter MixDesign (%bydry(masslorsoil))			
Component	· . Mk2	SA Mix6	Clibx77	Mix 9
MGP Impacted Soil	100	100	100	100
GGBFS Addition	6	0,	0	6
Cement Addition	2	10	10	2
Bentonite Addition	0	0.5	1	0.5
Water Addition	Varies	Varies	Varies	Varies

Mix design components for each of the initial Phase I testing mixes consisted of the following:

The amount of water required to make an effective mix design varies depending on soil moisture content and soil type. For the treatability study, the water to reagent ratio used for preparation of the ISS grout for all mixes was 0.8 to 1. The amount of water required during full-scale implementation will be verified during the ISS pilot testing. Performance data for each mix designs tested during Phase I are summarized below (Appendix B4):

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Mix (psi)			Hydraulic Conductivity (cm/s)			
Design	7 days	14 days	28'days	7 days	14 days	28 days
Mix 2	112	229	313	1.1 x 10 ⁻⁷	4.6 x 10 ⁻⁸	2.2 x 10 ⁻⁸
Mix 5	49	56	. 72	7.6 x 10 ⁻⁶	5.0 x 10 ⁻⁶	2.9 x 10 ⁻⁶
Mix 7	45	55	. 67	5.1 x 10 ⁻⁶	3.3 x 10 ⁻⁶	2.0 x 10 ⁻⁶
Mix 9	129	216	296	9.0 x 10 ⁻⁸	2.5 x 10 ⁻⁸	1.5 x 10 ⁻⁸

The results of Phase I testing indicate that Mixes 2 and 9 achieve the design goals listed in Section 3.5.1. To further evaluate achieving the permeability design goal while controlling strength to allow for feasible excavation in the future, Mixes 1 and 8, which include a lower percentage of reagent addition in comparison to Mixes 2 and 9, were selected for Phase II testing. The results of Phase II testing are summarized below:

Mix@estein	UGS CurlingAge Approx 30 days ([Ed])	HydreulleConductivity Cuing Age Approx 80 days (em/s)
Mix 1	257	5.6 x 10 ⁻⁸
Mix 8	237	2.0 x 10 ⁻⁸

Phase I and Phase II testing indicated that Mixes 1, 2, 8, and 9 all were suited to meet the design goals listed in Section 3.5.1 and can achieve strengths that allow for future property redevelopment or excavation. Mixes 1 and 2 were selected for final testing because these mixes achieved the design goals and had fewer material components (i.e., do not include bentonite) than Mixes 8 and 9, making Mixes 1 and 2 the more economic and implementable mixes. Final mix design testing including ANSI/ANS 16.1 leach testing, slake, freeze/thaw and wet/dry durability, and volume expansion testing for Mixes 1 and 2 is currently underway. Leach testing analytical parameters, intervals, and design goals are provided in Table 3. Results of final testing will be included in the Final ISS Treatability Study Report.

Laboratory testing results and reports from Phase I and Phase II testing are provided in Appendix B5.



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3.5.4 Basis for ISS Mix Design Selection

The Phase I and II test results of the treatability study have confirmed that ISS can effectively solidify/stabilize MGP residuals. Specifically, results to date demonstrate that solidified MGP-impacted soils can achieve UCS greater than 50 psi and hydraulic conductivity less than 1 x 10⁻⁶ cm/s. A mix design that is designed to achieve these physical parameters can meet the removal action objectives for MGP-impacted soil and groundwater discussed in Section 3.1.

The mix design for full-scale implementation is anticipated to be either Mix 1 or Mix 2, pending receipt final testing data and comparison to design goals.

As the ISS treatability study progresses, additional data will become available to complete the final design for ISS construction. The final testing parameters include:

- Leach Testing: ANSI/ANS 16.1 leach test data for Mix 1 and Mix 2 (all leach intervals)
- Slake (submergence testing) observations for subsequent leach test
- Wet/Dry Durability testing (complete data set)
- Freeze/Thaw Durability testing (complete data set)
- Volume expansion calculations (Mix 1 and Mix 2)

3.5.5 Completion of the ISS Study and Future Submittals

Pursuant to the current ISS treatability study schedule, final data should be available in October/November 2012 to confirm the preliminary basis for ISS design. The full dataset and all testing results will be compiled into a final report that will include the following:

- Description of all sample handling and compositing procedures and methodologies, chemical E. analyses, and physical analyses used to initially characterize samples
- Description of mix design development and handling procedures (e.g., cure times and 5 methods), selection for testing procedures, and quality assurance/quality control procedures
- Summary tables of all testing data R
- Copies of all raw testing data, lab reports, and chain of custody forms Ξ
- Conclusions drawn from the study including recommendations for the mix design(s) that economically achieve the study objectives and ISS design goals
- Preliminary recommendations for full scale construction implementation



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The Final ISS Treatability Study Report will be submitted to the USEPA as an addendum to this Removal Action Work Plan.

3.5.6 ISS Pilot Scale Evaluation

Within a month prior to full scale ISS implementation, a pilot-scale evaluation will be performed to field verify that the selected ISS mix design(s) will meet the established ISS design goals. A minimum of one pilot test location, each including two ISS columns, will be completed in each of the designated removal action areas. Pilot evaluation quality assurance/quality control samples (QA/QC) will be collected from the columns for testing. A preliminary CQA plan for the pilot scale evaluation is provided in Table 4. The plan will be revised, if necessary, following treatability study test completion and provided in an addendum to this work plan to be submitted in fall 2012. During the pilot test, samples will be collected for hydraulic conductivity and UCS. Upon confirmation that the pilot column samples meet the design performance goals based on the 7-day cure test results for the selected mix design(s), ISS will proceed to full-scale construction. The pilot scale evaluation and UCS and permeability results will be used to refine the field application of the ISS mix design(s) including reagent addition and water-to-reagent ratios for ISS grout application.



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4 REMOVAL ACTION IMPLEMENTATION

4.1 Preliminary Activities

4.1.1 Site Security and Controls

The Site is secured with an existing chain link fence that surrounds Parcels 1, 2, and 4. NSG currently maintains gated and secured entrances to the Site at 849 Pershing Road, Waukegan, Illinois and an additional gate is located on Dahringer Road. The gates will serve as the access and exit points during the removal action. Each gate will be locked when no workers are present. A visual barrier may be added to the existing fence and gates surrounding the Site.

All visitors will be required to sign a visitor's log when entering and exiting the Site. Access to removal action areas will be limited to authorized personnel approved by IBS and will be required to participate in a site-specific health and safety briefing by the site supervisor or health and safety officer prior to entry.

4.1.2 Surveying

At a minimum, the following items will be surveyed at the Site:

- Stake out of the proposed removal action areas
- ISS column locations and top and bottom elevations
- Lateral extents of shallow soil excavations
- Locations and elevation of former MGP pipes and/or foundations left in-place at the removal extents, if applicable
- Location and elevation of ISS swell material
- Final lateral and vertical surface contours of areas disturbed during construction
- Final site improvements and surface elevations
- Property boundaries
- Current and remaining wetlands (if applicable)
- Existing and new utilities



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4.2 Site Preparation

Site preparation will include protection, removal, or relocation of utilities if needed, installation of erosion controls, clearing and grubbing of vegetation, abandonment of monitoring wells located in removal action areas, construction of a temporary on-site truck access road, and establishment of truck routes. Trees that do not interfere with removal actions will be protected from construction activities to the extent practical. Concrete barricades or steel traffic bearing plates will be placed around or on monitoring wells that will remain. Site preparation plans are shown on Figure 8.

4.2.1 Protection of Utilities and Construction Utilities

As discussed in Section 2.3.1, no active underground utilities have been identified that will interfere with proposed removal action areas. Overhead utilities exist along the EJ&E Railroad east of the Site and in Parcels 4 and 2. Overhead utilities that exist in Parcel 2 may require coordination with the utility provider to support, relocate, or remove the utility prior to or during removal action activities. This utility crosses the planned removal action area on Parcel 2.

If utility modifications are necessary, IBS will coordinate with the utility provider. Additionally, coordination with utility providers will occur to facilitate installation of utility services as necessary for construction operations. Construction operations will require, at a minimum, electrical and/or communication services for office trailers, air monitoring equipment, and the ISS batch plant. In addition, the contractor's site superintendent will be specifically tasked with ensuring all utility conflicts are cleared as construction progress.

4.2.2 Runoff and Erosion Control

Runoff and erosion control measures will be implemented in accordance with Title 35 IAC Subtitle C, Chapter I and City of Waukegan requirements. Prior to beginning site work, the following minimum erosion control activities will be performed:

- A tracking pad of open graded stone will be placed at truck entrances/exits to minimize off-site tracking of material from truck tires.
- Silt fence will be placed around removal action areas or around the site perimeter, as appropriate.
- Material management and decontamination areas will be bermed on all sides to prevent sediment run-off.



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- Filter fabric will be placed above existing storm sewer catch basins, if any exist near the Site, to prevent sediment from entering state waterways.
- Street sweeping will be used, as necessary, to promptly remove potentially tracked materials on public right-of-ways.
- If necessary, additional measures will be taken to prevent run-on of surface water, particularly to prevent surface water contact with the removal action areas.

Installation methods and maintenance procedures for silt fence and inlet protection will follow best management practices. Trucks, grading equipment, and other construction vehicles will use constructed tracking pads to minimize tracking of soil off site. Erosion control measures will be maintained throughout construction activities until permanent erosion control measures are in place.

The contractor will be responsible for implementing an adequate erosion control plan and complying with all applicable requirements including conducting site inspections. At a minimum, inspections will satisfy the following requirements:

- Document the conditions and/or repair of silt fences and/or catch basin filter fabric
- Document sediment accumulation amounts adjacent to fences and/or on catch basin filter fabric
- Evaluate eroded or potentially unstable soils

Inspections will be made weekly and within 24-hours after rainfall events of 0.5 inches or greater, or as directed by the oversight engineer. Maintenance activities may include removal of sediment from fences and/or catch basin filter fabric, and repair as needed. Weekly inspection logs will be maintained at the Site.

This erosion control plan will be further documented within the Storm Water Pollution Prevention Plan (SWPPP) to be prepared in accordance with the requirements of the National Pollution Discharge Elimination System (NPDES) General Permit for construction activities.

4.2.3 Clearing and Grubbing

Clearing and grubbing will be performed following placement of temporary erosion control measures and will include the removal of trees, shrubs, stumps, and roots from within the removal action and operational areas. Roots and root balls removed during clearing and grubbing will be transported off site for disposal. Trees and shrubs removed during clearing and grubbing may be chipped and stockpiled on site for potential use during construction, if required. Alternately, trees and shrubs will be transported off site for disposal.



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4.2.4 Route of Ingress and Egress for Construction

Construction ingress and egress points will be through the existing gates on Pershing and Dahringer Roads as shown on Figure 8.

A temporary truck access road will be constructed that may consist of placement of an 8-oz non-woven geotextile (if needed) and a 6 to 12-inch layer of stone or base course material. To the extent practical, the existing gravel surface near the gate on Dahringer Road will be left in place and reused for construction traffic.

During construction activities, trucks will enter and exit the Site at gated entrances, where appropriate signage will be posted to identify the construction entrance and exit. All trucks will be covered and securely fastened before leaving the Site.

4.2.5 Monitoring Well Abandonment

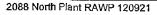
Existing monitoring wells within proposed removal action areas will be abandoned prior to construction. The following wells shown on Figure 2 are targeted for abandonment:

- MW3D and MW3S on Parcel 1
- MW4D and MW4S on Parcel 2
- MW5D and MW5S on Parcel 2
- MW9D and MW9S on Parcel 2
- Barr-MW-1 and Barr-MW-2 on Parcel 1.

The following wells are near proposed excavation areas and may require abandonment if removal action limits are expanded laterally:

- MW6D and MW6S on Parcel 1
- MW8D and MW8S on Parcel 1
- MW11D and MW11S on Parcel 1

Monitoring wells will be abandoned in accordance with the *Multi-Site Field Sampling Plan Revision 4*, dated September 8, 2008, and in accordance with Title 77: Public Health; Chapter I: Department of Public Health Subchapter r: Water and Sewage Part 920 Illinois Water Well Construction Code; Section 920.120 Abandoned Wells.





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4.3 Fugitive Emission Control

Site activities could generate fugitive emissions including vapor, dust, odor, and noise. A standard level of care will be taken to minimize fugitive emissions. Fugitive emission control measures may include the use of sheet plastic and/or water or foam-based vapor suppression agents. Sheet plastic may be used to provide a physical barrier to fugitive vapor and dust emissions specifically on inactive stockpiles or open excavations. Soil wetting using potable water with or without additives may be sufficient to control fugitive dust emissions from stockpiles, excavated areas, and access roads. A vapor suppression agent (e.g. Rusmar™ Foam or similar) will be applied to open excavations, completed ISS areas, and stockpiles of MGP impacted materials when necessary to mitigate odors. Fugitive emission controls will be applied in accordance with the fugitive emissions management plan.

4.4 Removal Action Operations

Removal action operations will consist of the following elements:

- Pre-excavation and Excavation
- Management and Disposal of Excavated Materials
- In situ Solidification/Stabilization
- On-site Materials Management
- Excavation Dewatering
- Equipment Decontamination

4.4.1 Pre-Excavation and Excavation

Pre-excavation and excavation within the removal action areas will be conducted to remove and demolish subsurface structures/foundations and debris, to excavate shallow soil for construction of an ISS work platform, and to accommodate ISS swell generated from ISS treatment. Pre-excavation and excavation activities will be performed in each removal action area prior to ISS construction.

Oversized debris and materials excavated, removed, and generated during demolition of subsurface MGP structures will be managed within removal action areas or material management areas and taken off site for landfill disposal in conjunction with disposal of excavated shallow soils.

Three main tasks during this phase of the removal action include shallow soil excavation, pre-excavation, and construction of ISS platform.





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4.4.1.1 Shallow Soil Excavation

Shallow unsaturated (top 4 feet) soils will be removed within delineated removal action areas shown on Figure 6. Shallow excavation will stop at the groundwater table if shallower than 4 feet. An exception will be made in areas where subsurface MGP structures and foundations require demolition and removal. In these cases, soil excavation and structure removal will extend as deep as necessary to remove the debris. Excavated soils will either be used to fill voids following structure and debris removal within removal action areas and managed with ISS or will be transported off site for landfill disposal. As presented in Section 3.4, approximately 47,310 cubic yards of soil and debris are proposed for excavation and disposal.

During shallow soil excavation, soils will be inspected for MGP residuals and additional MGP related structures/foundations at the delineated limits. If MGP residuals or subsurface structures are present beyond the proposed removal action area, the shallow excavation may be expanded to remove remaining MGP-related materials.

The excavation process will occur in a staged progression to minimize the duration of open excavations and allow for adequate access to removal action areas for completing ISS construction. Soil excavation will be performed with conventional hydraulic excavators. To the extent practical, excavators will load soil directly from the excavation into conventional quad-axle or semi dump trucks for transport and landfill disposal. Temporary stockpiling of these soils is discouraged but may be necessary. Phasing and work sequencing will be further developed during the final design phase.

4.4.1.2 Pre-Excavation for ISS

Pre-excavation will be conducted within removal action areas to depths greater than required for shallow soil removal to verify removal of all subsurface structures, obstructions, and oversized debris. All subsurface structures and obstructions are expected to be removed within the removal action areas. Additionally, subsurface structures that extend beyond the removal action limits may be removed depending on contractor and equipment capabilities and structural considerations for surrounding roads and infrastructure, if applicable.

If encountered, remnant MGP piping will be investigated for MGP residuals. If MGP residuals are present in the piping, they will be removed to the extent practicable and treated or disposed following characterization. At the removal action limit, pipes will be abandoned in place and capped.

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Following debris removal, excavations may be backfilled with the excavated MGP impacted soils within the removal action areas in preparation for ISS construction.

4.4.1.3 ISS Platform Construction

Following shallow soil excavation and pre-excavation, an ISS working platform will be constructed to an elevation approximately 4 feet bgs. The constructed elevation may vary to maintain a stable working platform above the groundwater table. The purpose of the ISS construction platform is to:

- Provide a level working platform for the ISS equipment
- Provide area to manage ISS swell material
- Provide surface water run-off control from the removal action areas

4.4.2 Management and Disposal of Excavated Materials

During the pre-excavation and excavation activities, materials will be visually inspected for MGP residuals and segregated into the following categories:

- Non-MGP impacted construction debris
- MGP impacted construction debris
- MGP impacted soil/source material
- MGP impacted soil/source material at or above Subtitle D landfill permit levels

Segregation and management of excavated materials will include the following activities:

- Non-impacted construction debris will be temporarily stockpiled on site in a designated clean stockpile area prior to loading and transport to a recycling facility or disposal facility as construction debris.
- MGP impacted construction debris will be loaded and transported in covered trucks to the landfill for disposal. MGP impacted construction debris that is not directly loaded for immediate disposal will be temporarily stockpiled within the removal action area limits or within the appropriate material management area. MGP impacted construction debris that is too large for transport will be mechanically demolished prior to transport. Fugitive emission controls will be employed for stockpiles that remain after work hours.
- Remnant MGP piping will be cut or broken into manageable sections for loading and transport in covered trucks to the landfill for disposal. MGP residuals will be removed from the piping to the extent practicable and characterized prior to treatment or disposal. The piping may be temporarily stored either within the removal action area or in the appropriate material management area.

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- MGP impacted soil/source material may be placed within the removal action areas for ISS treatment or transported in covered trucks for landfill disposal. Soil that is not directly loaded for immediate disposal or placed for ISS treatment will be temporarily stockpiled within the removal action area limits. Fugitive emission controls will be employed to stockpiles as necessary.
- MGP impacted soil/source material that exceeds Subtitle D landfill permit limits will remain on site and managed with ISS. Based on existing analytical data, potential MGP source material above the Subtitle D landfill acceptance criteria could be encountered in isolated sections of the removal areas. These locations will be identified based on existing analytical data and materials within these areas will remain on site for management with ISS.

4.4.3 On-site Materials Management

To facilitate proper on-site segregation and staging of materials during the removal action, the following staging areas will be set up as illustrated on Figure 8:

- <u>Material Management Area</u>: MGP source material and MGP impacted debris that requires stockpiling prior to transport for disposal may be stockpiled within this area. The area will be constructed with a low permeability working surface (e.g., asphalt pavement or polyethylene lined pad), a sump, and berms.
- <u>Decontamination Area</u>: This area will be used to decontaminate construction equipment. The area will be constructed with a low permeability working surface, a sump, and berms. Liquids generated during decontamination activities will be managed similarly to the excavation dewatering treatment discussed in Section 4.4.4.
- <u>Clean Staging Area</u>: Clean, imported fill materials will be stockpiled in this area. The Clean Stockpile Area will consist of silt fence or berms around the perimeter to minimize potential storm water run-off.
- <u>Water Treatment Pad</u>: If required, a mobile pre-treatment system will be staged here. Water collected from excavation dewatering will be treated prior to discharge to the sanitary sewer system, as described in Section 4.4.4.

4.4.4 Excavation Dewatering

If required, excavations and removal action areas will be dewatered to facilitate removal activities. Dewatering will be performed via a trench along the bottom of the excavation or via down-hole sumps equipped with pumps of adequate capacity. Water will be pumped to frac tanks for solids settling. The water may either be directly discharged to an NSSD sewer on site, pumped through a mobile pretreatment system and then discharged to the sewer (as approved by NSSD), or reused in the production of ISS grout at the batch plant. If a pre-treatment system is required, it will likely consist of bag filters and granular activated carbon units.



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Residuals resulting from the groundwater pretreatment system may include:

- Granular Activated Carbon
- Bag or cartridge filters
- Solids from frac tanks

Bag or cartridge filters and solids will be transported for landfill disposal. Granular activated carbon may either be regenerated at a dedicated facility or transported for landfill disposal.

4.4.5 In Situ Solidification/Stabilization Construction

Following completion of shallow excavation and pre-excavation, ISS will be performed to solidify/stabilize MGP source material within the removal action areas to the depths indicated on Figure 7. ISS construction will be completed as described below.

4.4.5.1 ISS Layout and Design

The layout of the ISS construction activities including the designed limits, depths, and alignment of the ISS treatment is provided on Figure 7.

A layout of the ISS column locations will be provided by the ISS contractor prior to construction for review and approval. Typical ISS column diameters range from 8 to 12 feet. Various diameter columns may be used depending on the subsurface soil conditions, site constraints or layout, or project schedule. Columns will be spaced based on a "neat line" overlap shown on Figure 7 (i.e., 0 feet of overlap where three columns intersect). This pattern of overlap represents the industry standard design of ISS remediation projects.

Each ISS column will include continuous application from the ISS platform surface to the depths designated on Figure 7. Each ISS column will have a unique lateral location (northing, easting) and top and bottom treatment elevations. Each column is survey located prior to construction.

ISS columns completed in removal action Area A will be constructed to a depth of at least 6 inches below the top elevation of the confining clay layer. Top of clay elevation contours will be provided to the selected remediation contractor for precise design of each ISS column. The final bottom ISS column elevation may be adjusted in the field based on the actual depth to the clay surface if determined different based on field conditions. ISS columns completed in removal action Areas B and C will be constructed to a depth that extends approximately 2 feet below the identified MGP source material, or at least 6 inches below the top



elevation of the confining clay layer as shown on Figure 7. Additionally, the perimeter of Areas B and C will be extended to the clay surface to prevent potential migration of any residual impacts beneath the completed ISS in these areas.

Based on the removal action areas and depths the planned ISS construction, the quantity of MGP impacted soil/source material that will be stabilized/solidified is approximately 212,790 cubic yards, as indicated in Section 3.4 and shown on Figure 7.

4.4.5.2 ISS Operations

Final ISS equipment requirements will be evaluated and confirmed following selection of the ISS contractor. Typically, the following equipment will be required to complete ISS construction:

- Earth Moving Equipment: Conventional earth moving equipment including bulldozers and hydraulic excavators will be used during ISS construction to manage materials including soil and ISS swell. Ancillary equipment needed for daily operations and construction will include front-end loaders, fork lifts, man lifts, vibratory compaction equipment, and quad-axle or semi dump trucks.
- ISS Batch Plant: ISS grout will be prepared using an on-site batch plant. Grout plants operate by mixing known quantities of reagents and water to form an ISS grout of predetermined proportions in accordance with the mix designs specified from the ISS treatability study. Grout is then pumped from the mixing plant to the point of use. Typically, the grout plant will consist of, at a minimum: a storage silo, mixing tank, storage tank, and grout pump (e.g., moyno pump, a type of progressive cavity pump). A secondary bulk dry reagent storage vessel, sometimes called a "pig" is typically added to the system as additional on-site storage for reagent, which prevents delivery trucks from having to supply reagents directly to the overhead silo. The storage vessel can hold approximately six truckloads of reagents as opposed to the storage silo that can hold approximately one truckload. This setup will aid in scheduling reagent deliveries and minimize operational downtime.
- Vertical Rotary Mixing System (ISS rig): Vertical rotary mixing systems utilize a Kelly-bar drive system either attached to a track-type crawler crane or a hydraulic type unit (e.g., Delmag) that includes the following key components:
 - <u>Power Unit</u>: Supplies power that turns the Kelly bar. Systems can be diesel, electric, hydraulic, or a combination of these. The power unit can be a drill table attached to a crawler type crane or a hydraulic unit (e.g., Delmag).
 - <u>Kelly</u>: The rod that mixing tools are attached to and grout is conveyed through to the mixing tool. The Kelly can be modified depending on the required treatment depth.
 - <u>Tool:</u> Augers that are advanced through the subsurface while mixing the soil and grout. Tools sizes can be modified depending on required mixing area. For this project, mixing tools are anticipated to be 8 to 10 feet in diameter.



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Typical ISS construction uses vertical rotary mixing systems to stabilize soil in place by mixing a cementitious grout and impacted soil. Grout is pumped to the top of the hollow Kelly. Grout flows through a secondary pipe inside the Kelly and exits through ports on a multi-blade mixing tool attached to the bottom end. The tool loosens the soil while a grout is pumped into the loosened soil as the tool advances from the ground surface to a target depth. Since a mixing tool loosens but does not remove soil, a drilling fluid is needed to lubricate the tool as it turns and advances through the subsurface. For this application the lubricant is typically the ISS grout itself.

Once the appropriate ISS mix design is prepared at the ISS batch plant, the ISS rig is lined up over an ISS column location and ISS treatment of the targeted soils can commence. A typical sequence of activities for installation of each ISS column is as follows:

- 1. The ISS rig positions the auger over the column and the location is confirmed via total station survey. This ensures each ISS column is placed in the correct location and ensures the integrity of the column overlap with adjacent columns.
- 2. The appropriate mix design is prepared in the batch plant and the ISS grout is transferred to the ISS rig.
- 3. The ISS rig begins advancing the auger into the targeted soils. As the auger is advanced, the flow of the mix design slurry is started and is injected into the soils through orifices in the mixing paddles on the auger. The mixing paddles blend the mix design slurry with the soil as the auger continues to advance until the target depth is reached. In general, the majority of the mix design slurry is mixed with the soils as the auger penetrates downward.
- Once the auger reaches the column target depth, the remainder of the mix design slurry is injected as the auger is withdrawn from the ISS column so that the blending process is repeated.
- 5. The auger may make repeated up and down passes as necessary to adequately blend each ISS column. Often, a minimum of three passes are performed at each column location.
- 6. Upon completion of the ISS column, the ISS rig is moved to the next column location.

ISS performance will be monitored with an ISS CQA Plan as described in Section 6.5 and will be primarily based on the established design goals for UCS and hydraulic conductivity as presented in Section 3.5.1.

4.4.5.3 ISS Swell Management

Full-scale ISS construction will result in expansion of the treated soil. The expansion, often referred to as "swell," is a result of blending reagent mixtures with the soil. Depending on the soil type, the swell can range from 10% (sandy materials) to 40% (clayey materials) of the original treatment volume. Final testing during the ISS treatability study and the ISS pilot test will provide an estimate of ISS swell expected for

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this application. An ISS swell management plan will be developed during final design and is anticipated to be based on the following parameters:

- To minimize off-site disposal of contaminated materials, ISS swell material will be managed on site and within the removal action area limits to the extent practical.
- ISS swell will be managed in place following ISS column completion when appropriate. If necessary ISS swell could be transported for management in other removal action areas and graded to the elevation contours developed during final design.
- Elevation contours developed during final design will promote positive drainage of surface water and infiltration of surface water at the edges of removal action areas.

4.4.6 Equipment Decontamination

Decontamination of equipment and management of generated decontamination wastes will be performed in accordance with the site-specific Health & Safety Plan. All equipment will be decontaminated within the designated decontamination area. Final equipment decontamination, prior to demobilization, will consist of dry mechanical removal (i.e., scraping or brushing) of any loose material followed by pressure washing.

Road trucks will not be allowed within the removal action limits to prevent off-site tracking of excavated materials. A tracking pad will be located at the truck entrances and exits as an additional measure to prevent off-site tracking of excavated materials.

Excavation and ISS equipment visibly containing MGP-impacted materials will be decontaminated prior to being moved from one location to another, as necessary to control cross-contamination between removal areas and areas not being removed.

Additional equipment decontamination procedures are described in the *Multi-Site Health and Safety Plan* (NRT 2007).

4.5 Site Restoration

Imported clean fill will be used as backfill. Backfill material will be imported from a clean borrow source and may include stone, coarse aggregate, or fine-grained material depending on local availability and future site use.

A clean soil cover will be constructed over the removal action areas following ISS construction and ISS swell management. The soil cover will consist of clean imported fill and topsoil and will be constructed



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with the intent to meet the requirements of Illinois TACO: 35 IAC 742, Section 742.1105 for engineered barrier construction.

To the extent practical, the final ground surface will be restored to match preconstruction conditions. Final ground surface in select areas will either be vegetated or consist of coarse aggregate. For vegetated areas, topsoil, with appropriate seeding and mulch, will be placed on top of the clean backfill. For gravel areas, such as access roads, a layer of gravel will be placed on top of the clean backfill.

All erosion controls used during construction activities will be removed at the completion of the removal action. Post-construction erosion controls will be installed along the downgradient edge of the disturbed areas and as needed until vegetation is established.



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5 STATE AND LOCAL REQUIREMENTS

5.1 Storm Water Discharge

The proposed removal action is expected to disturb an area exceeding one acre; therefore, the proposed construction activity is subject to NPDES requirements under the jurisdiction of the Illinois IEPA, Division of Water Pollution Control. The following storm water related permitting will be completed to ensure compliance with the IEPA's construction site storm water program:

- A Notice of Intent for General Permit to discharge storm water associated with construction site activities (IEPA Form IL 532 2104) will be prepared and submitted to IEPA. The notice will include the following elements: identify NSG as the site owner, provide contact information for the Contractor, provide construction site information and description of the proposed work, and identify the receiving water body for storm water run-off.
- A SWPPP will be developed and submitted to IEPA. The SWPPP will include the following elements: provide a detailed site description, outline planned erosion and sediment controls, and planned storm water management controls. The SWPPP will be in place prior to the start of construction activity and will be maintained on site throughout the removal action.
- A Notice of Termination will be prepared and submitted to IEPA once site conditions are fully stabilized following the completion of construction activities.

5.2 Wetlands

As described in Section 2.1.1, previous wetland delineation and associated permitting and approvals were no longer valid for the Site. Consequently, Site wetlands were re-delineated in May 2012 by Hey and Associates, Inc. (HEY) in accordance with the Lake County Watershed Development Ordinance (WDO). Following delineation, HEY and NRT prepared and submitted a *Request for Preliminary Wetland Jurisdictional Determination and Isolated Wetland Boundary Verification* on May 23, 2012 including the following:

- Request for Preliminary Wetland Jurisdictional Determination and/or Isolated Wetland Boundary Verification Form
- Wetland Determination Data Forms
- Aerial Exhibit depicting the surveyed wetland boundaries for 3 wetlands and data point locations



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LCSMC provided jurisdictional determination and boundary verification concurrence in correspondence dated June 11, 2012. LCSMC found that delineated wetlands 1, 2, and 3 were "Isolated Waters of Lake County" as defined in the Lake County WDO and concurred with the wetland boundaries as flagged in the field. Jurisdictional determination and boundary verification correspondence are provided in Appendix C.

Following jurisdictional determination and boundary verification, review of historical site data by HEY and NRT suggested that the site wetlands were delineated in areas where historic site grading and filling had taken place, and available maps and aerial photographs suggested that wetlands did not exist historically on the property prior to the filling activities. To present these findings to LCSMC, HEY and NRT compiled maps, aerial photographs, boring logs, and other supporting documentation and submitted the data to LCSMC on July 12, 2012. On July 16, 2012, LCSMC, NRT, HEY, and IBS met to review the compiled data and discuss the site wetlands. In email correspondence on July 17, 2012, LCSMC confirmed that wetlands 1 and 2 met the exclusion criterion a.(2) under the definition of Isolated Waters of Lake County in WDO Appendix A, thereby excluding them from regulatory status under the WDO. LCSMC issued a formal letter excluding wetlands 1 and 2 on August 6, 2012. Correspondence regarding exclusion of wetlands 1 and 2 is provided in Appendix C.

Wetland 3 in the southwest area of the site, as shown on Figure 2, does not meet any of the exclusion criteria. This small wetland appears to be a remnant wetland on the Site based on the information reviewed. Therefore, this small wetland remains regulated under LCSMC's jurisdiction. If the wetland is or were to be impacted, written authorization from LCSMC would be required. Because of the wetlands size, less than 0.1 acres, impacts to this non-high quality wetland would qualify for LCSMC's General Permit #2, and no subsequent mitigation would be required. At this time, the proposed removal action will not impact this wetland as shown on Figures 6 and 7.

5.3 Additional Coordination and Permitting

Coordination with governmental agencies and utility providers will be required for the following project elements:

List of Coordination Points

(item	Governmental Agency/Utility
Applicable construction related permitting may include a Watershed Development Permit (WDP), erosion control, building, and demolition.	City of Waukegan
Overhead electric line relocate, removal, or rerouting.	ComED



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Item	Governmental Agency/Utility
Authorization to discharge possible MGP impacted groundwater or surface water as part of the removal activities to the local sewer system.	North Shore Sanitary Sewer District
Storm Water Discharge Authorization.	Illinois Environmental Protection Agency, Division of Water Pollution Control

Additional approvals will be secured by the affected contractors, as needed during construction.

5.4 Off-Site Disposal

Excavated MGP-impacted debris and soil will be disposed at Countryside Landfill, located in Grayslake, IL, a Subtitle D landfill. Countryside is approved by the USEPA with respect to the Off-Site Rule as set forth in the National Contingency Plan in 40 CFR 300.440. Soil and debris disposal will be in accordance with the existing Waste Management Profile Number EF 1496. Waste profile documentation is provided in Appendix E.

5.5 Beneficial Use of Ground Granulated Blast Furnace Slag

Use GGBFS as one of the reagents used in an ISS mix will be in accordance with Illinois regulations (Title 35, Subtitle G: Waste Disposal, Chapter I: Pollution Control Board, Subchapter I: Solid Waste and Special Waste Hauling, Part 817, Subparts A and B). Specifically, beneficial use of GGBFS will be in accordance with Part 817, Subpart B, Sections 817.201 through 817.204; the generator of the GGBFS will certify that the waste sent to an offsite beneficial use meets the Subpart A requirements for beneficial waste prior to use.

5.6 Class V Injection Well Inventory

If required by IEPA Bureau of Land and as applicable, a Class V Injection Well Inventory will be completed prior to beginning ISS construction. The owner of a Class V well is not required to obtain a permit prior to beginning injection; the Inventory is completed to identify the type of Class V well and the nature of the injection activity.



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6 CONSTRUCTION QUALITY ASSURANCE MEASURES

This section describes the following construction quality assurance measures that will be employed during the removal action.

- Air Monitoring
- Fugitive Emissions Management
- Health and safety
- Sampling and analysis

6.1 Air Monitoring Plan

Removal action activities have the potential to generate emissions, including odor, fugitive respirable particulate matter less than 10 μ m in diameter (PM₁₀), and vapor phase COCs. Potential emission sources include the following:

- <u>Soil Excavation</u>: Potential emissions consist of VOC vapors and fugitive dust during soil excavation and loading into trucks.
- In Situ Solidification/Stabilization: Potential emissions consist of non-MGP related fugitive dust (i.e., dry reagent) and MGP-related vapor/odor emissions as the soil is disturbed by mixing.
- <u>Excavated Material Management</u>: Potential emissions consist of fugitive dust and/or vapor/odor emissions from stockpiles and during material handling.

Pre-construction air monitoring will be performed to document background levels of particulates and vapor phase COCs at the Site. Air monitoring will be conducted at the Site perimeter during removal action activities to ensure engineering measures are being protective of public health and the environment and to determine when response actions are warranted. Specific air monitoring elements are likely to include the following:

- Establishing a dedicated continuously operated weather station at the Site to monitor meteorological conditions.
- Collecting pre-construction background air samples to establish baseline ambient air concentrations.



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- Continuously monitoring TVOCs and PM₁₀ with fixed air monitoring (FAM) stations at the Site perimeter.
- Supplemental periodic handheld operational air monitoring for TVOCs, benzene, and PM₁₀ during active work periods using portable and handheld equipment for comparison with established Action Levels.
- Collecting 24-hour time-weighted SUMMA canister samples along the Site perimeter during active construction. SUMMA canisters will be used to collect 24-hour time-weighted average samples for VOC analysis. Results will be compared to the site-specific risk-based acceptable air concentrations (AAC) presented in Appendix D.
- Collecting 24-hour time-weighted polyurethane foam (PUF) samples along the Site perimeter during active construction. PUF samples will be used to collect 24-hour time-weighted average samples for PAH analysis. Results will be compared to the site-specific risk-based AACs presented in Appendix D.

Air monitoring activities will be conducted by a qualified air monitoring contractor. The air monitoring contractor will support planning, implementation, and documentation of a comprehensive perimeter air monitoring program during removal action activities. The air monitoring contractor will work with the removal action contractor and the engineer through all phases of the removal action to ensure appropriate control and mitigation of vapor phase, fugitive dust, and odor emissions.

6.1.1 Real-Time Perimeter Air Monitoring

Real-time air monitoring for TVOCs and PM_{10} will be conducted along the Site perimeter continuously at FAM stations. The intent of the real-time monitoring program is to provide an early detection of short-term emissions and potential off-site migration of removal action related TVOCs and PM_{10} . Real-time FAM stations will operate 24-hours per day, 7-days per week, during periods of removal action activity. The real-time perimeter air monitoring system consists of FAM stations that are supported by a central computer and an alarm notification system.

The FAM stations are typically programmed to measure 15-minute average TVOC and PM_{10} concentrations. Each station will include a gas chromatograph programed to differentiate individual BTEX compounds if the 15-minute TVOC average exceeds the Action Levels described in Section 6.1.5. The FAM stations will transmit data in real-time to a central computer via wireless radio telemetry. The central computer will be programed to compare the TVOC and PM_{10} 15-minute averages to the Action Level. If an Action Level is exceeded, an alarm will display on the central computer and predetermined individual(s) will be notified.

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6.1.2 Time Weighted Average (24-Hour) Perimeter Air Monitoring

The proposed air sampling strategy is divided into three categories: background monitoring, full-scale startup, and full-scale operations. Each category has distinct sampling frequencies and quantity requirements. Frequencies and quantities may be revised during construction. Sampling requirements include the following:

- <u>Background</u>: Prior to startup of full-scale operations, background air sampling and monitoring will be conducted to establish baseline concentrations for comparison with AACs. In addition to continuous real-time monitoring with the FAMs, 24-hour SUMMA and PUF sampling will be performed at upwind and downwind locations along Site perimeter. The SUMMA samples will be analyzed for VOCs including naphthalene (USEPA Method TO-15). The PUF samples will be analyzed for PAHs (USEPA Method TO-13A).
- <u>Full Scale Startup</u>: During approximately the first two months of full-scale operation, 24-hour SUMMA samples will be collected at upwind and downwind locations along the Site perimeter three times per week. 24-hour PUF samples will be collected at upwind and downwind locations along the Site perimeter a minimum of once per week. Priority (3-day) laboratory turnaround will be requested for rapid assessment of the analytical results. The duration of the Full Scale Startup period may be extended based on site-specific conditions that could include weather and work activities.
- <u>Full Scale</u>: During the remaining duration of full-scale operations, 24-hour SUMMA samples will be collected twice per week at upwind and downwind locations along the Site perimeter. PAH data will be collected with 24-hour PUF samples at upwind and downwind locations along the Site perimeter once per week or may be monitored indirectly by measuring the PM10 concentration (i.e., using real-time monitor), rather than using PUF samplers as described in Appendix D.
- With the exception of full scale startup, samples will be analyzed within the 14-day holding time unless real-time monitoring results indicate that the sample analysis should be expedited to evaluate potential on-site exceedances of AACs.
- Upwind and downwind samples will be located along the Site perimeter based on removal action activities, accessibility, receptors, and weather conditions.
- Field duplicates for the SUMMA canisters and PUF samples will be collected at a frequency of one per 20 samples. Duplicates will be obtained by collecting two concurrent samples from a single location and having both analyzed by the laboratory.

6.1.3 Real-Time Handheld and Observational Monitoring

Periodic real-time air monitoring using portable and handheld devices will be conducted along the Site perimeter prior to and during the removal action operations. The frequency and locations for monitoring will be based on site-specific conditions encountered during the removal operations and potential sensitivity of off-site receptors. Key requirements include of the following:

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- TVOCs will be monitored at least once daily along the Site perimeter during active work periods using a handheld photoionization detector (PID) at upwind and downwind locations.
- Benzene will be monitored at upwind and downwind locations using a handheid PID with a vapor-specific separation tube that analyzes specifically for benzene only when sustained concentrations of TVOCs are observed at or above the Action Level.
- PM₁₀ will be monitored at least once daily during active work periods using portable DustTrak[™] aerosol monitoring equipment, or similar.
- Odor will be periodically assessed along the Site perimeter during active work periods.
- Fugitive dust will be continuously monitored by visual assessment during construction operations.

6.1.4 Assessment of Meteorological Conditions

An on-site meteorological station will be used to measure wind speed, wind direction, relative humidity, ambient air temperature, and barometric pressure. Data will be relayed to a dedicated computer that will receive continuous meteorological data and compute a 5-minute running average of the wind speed and direction. The 5-minute running average wind direction will be used to identify upwind and downwind sample locations and to monitor off-site receptors. The information will be stored electronically and included in daily reports. Average daily temperatures and barometric pressures will be used to calculate 24-hour time-weighted average air sample volumes for the SUMMA canisters and PUF samples. Meteorological data may also be obtained from the National Data Buoy Center (Waukegan Station WHR12) in the event of a malfunction of the on-site station.

6.1.5 Action Levels

Action Levels will be used as a screening tool to manage construction activities to minimize the potential for off-site emissions. Action levels are selected at appropriate levels to avoid exceeding an action level from ambient air concentrations (e.g., exhaust from nearby parked cars) versus concerns that could be resulting from removal action operations. Exceedance of an Action Level at the Site perimeter will require a response action for vapor phase, particulate, and/or odor mitigation based on the conditions presented in Section 6.2.1. The effectiveness of the Action Levels to maintain off-site vapor phase emissions below the AACs will be assessed during the full-scale startup and may be adjusted, as appropriate. Proposed Action Levels for periodic real-time perimeter monitoring are summarized in the table below:

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Action Levels								
Parameter Action Level								
TVOCs	0.5 ppm greater than background (15-minute average concentration)							
Benzene	0.5 ppm							
Toluene	30 ppm							
Ethylbenzene	12 ppm							
Xylenes	15 ppm							
PM ₁₀	0.15 mg/m ³ greater than background (15-minute average concentration)							

These action levels are based on the following:

- The proposed action levels for TVOCs and BTEX have been used at other MGP sites to effectively predict compliance with AACs and what can be reliably measured the proposed equipment.
- The proposed action level for benzene is based on the on the California EPA Reference Exposure Level for acute 6-hour exposure of 0.4 ppm.
- The proposed action level for PM₁₀ is based on previously demonstrated performance at other MGP sites.

6.2 Fugitive Emissions Management Plan

Action Levels for fugitive air emissions will be used in a tiered approach to determine necessary response actions to different exposure conditions. In addition to the Action Levels provided in Section 6.1.5, a qualitative assessment will be performed for odor at the Site perimeter. An odor Action Level will be defined as conditions perceived to present a public nuisance or if a public complaint is received. Dust will also be assessed qualitatively based on observed off-site migration.

6.2.1 Emission Conditions

Three Emission Conditions have been developed based on the type and duration of an Action Level exceendace. The three conditions are depicted on Figure 9 and have the following definitions:

 Emission Condition 1: Air conditions for either TVOCs or particulates exceed the Action Level at the Site perimeter. Emission Condition 1 may also be triggered by odor at the Site perimeter that could pose a public nuisance and/or sustained off-site migration of visible dust. This condition initiates a yellow flag.



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- Emission Condition 2: BTEX concentrations exceed the Action Level or particulates continue to exceed the Action Level longer than 15 minutes. Emission Condition 2 will also be triggered if mitigation measures for an Emission Condition 1 are ineffective in reducing odors or visible off-site dust migration. This condition initiates a red flag.
- Emission Condition 3: Concentrations of BTEX or particulates continue to exceed an Action Level for an additional 15 minutes after Emission Condition 2 is initiated. Emission Condition 3 will also be triggered if mitigation measures for an Emission Condition 2 are ineffective in reducing odors or visible off-site dust migration or if a public complaint is received. This condition continues the red flag.

Site Condition information will be conveyed to the air monitoring contractor via visual confirmation on the base computer monitor paired with an automated cell phone notification to the air monitoring contractor's field technician. Following the receipt of the information, verbal notification will be made directly to the engineer by the air monitoring contractor's field technician.

In addition to monitoring Action Levels, monitoring of AACs at the perimeter will be conducted using 24-hour time-weighted sampling methods for target compounds. The objective for monitoring AACs is to confirm that any off-site fugitive emissions are below levels that would pose an exposure concern. If exceedances of the AACs are identified, modifications to the fugitive emissions response strategy may be required that could include more aggressive application of fugitive emission controls/measures and/or reducing Action Level concentrations for Site Condition response.

6.2.2 Notification, Communication and Response Procedures

Clear lines of communication and understanding of roles and responsibilities is critical to effectively responding to and implementing appropriate mitigation measures. Notification, communication, and response procedures will be in accordance with the following general procedure:

- Identification and Verification of an Emission Condition Alarm: The air monitoring contractor identifies and verifies the condition from an on-site activity.
- Notification and Communication: The air monitoring contractor notifies the engineer and contractor for a collaborative determination of the appropriate mitigation measures.
- Response Implementation: The contractor implements the mitigation measures.
- Assessment and Confirmation: The engineer and air monitoring contractor determine if the mitigation measures implemented were effective in reducing perimeter emissions.

Communication of an Emission Condition Alarm will be initiated by the air monitoring contractor to the engineer who will then coordinate and communicate with the remediation contractor to implement the appropriate mitigation measures. During initial notification to the engineer, the air monitoring contractor



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will verify that the alarm is not due to off-site emission sources. Following verification, the notification will be confirmed with the engineer and the air monitoring contractor, engineer, and remediation contractor will discuss the Site Condition and appropriate mitigation measures. Following implementation, the engineer will assess the effectiveness of the mitigation measures by communication with the air monitoring contractor who will continue to monitor changes to Action Level parameter concentrations. Changes in concentrations will be reported directly to the engineer by the air monitoring contractor. If mitigation measures are not effective, the engineer, air monitoring contractor, and the remediation contractor will meet to discuss and implement appropriate additional and/or modified mitigation measures.

Following implementation of the appropriate mitigation measures the engineer will assess the effectiveness of the mitigation measures by communicating with the air monitoring contactor and the remediation contractor. Following demonstration that the perimeter concentrations have been effectively reduced below, the engineer will confirm with the remediation contractor a return to an operational condition.

6.2.3 Mitigation Measures

Mitigation measures for fugitive emissions are divided into the following categories:

- Physical Controls: Physical controls are the primary mitigation measures and incorporate a variety of activities (e.g., good housekeeping practices, maintaining exclusion zones, and covering stockpiles). If Emission Condition 2 or 3 mitigation measures are required, modifications to the physical controls may include more aggressive activities such as daily covering of stockpiles or continuous use of water for dust suppression.
- Work Sequencing: Sequencing the work will limit emissions from freshly exposed soil and the amount of material that may require stockpiling pending further management. Other sequencing aspects include planning the operations to avoid double-handling of impacted materials and scheduling loading and off-site hauling to minimize the duration that staged materials will need to be maintained. If Emission Condition 2 or 3 mitigation measures are required, work sequencing may be modified.
- Site Layout: Requirements for site layout include planning by the contractor to locate proposed stockpile and material management areas away from potentially sensitive receptors to the extent practicable. These requirements will also include reassessment of site layout as necessary throughout construction.
- Engineering Controls: Required during Emission Condition 2. Engineering controls will consist primarily of the use of Rusmar™ Long Duration Foam (AC-645) or an equal product approved by the Field Engineer, Application produces thick viscous foam for immediate suppression of fugitive emissions. Foam application is not required under Emission Condition 1 but may be used for control of localized emissions in the removal action areas. The use of Rusmar AC-900 series may only be required under Emission Condition 3. This foam provides an extended duration and higher level of suppression effectiveness than the Rusmar AC-645.



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6.3 Health and Safety Plan

IBS, contractors, and NRT personnel will be qualified and knowledgeable with respect to health and safety requirements relating to the removal action. A site-specific Health & Safety Plan has been developed for IBS and oversight personnel working at the Site during all field activities in general accordance with the USEPA-approved *Multi-Site Health and Safety Plan Revision 2* (Prepared for Integrys, 2007). This plan will be a separate document and will be available upon request for review. A copy of the Health & Safety Plan is included in Appendix F. Project team members will read and be familiar with the plan prior to beginning field work.

Contractors retained to conduct the removal action will be required to have a written Health & Safety Plan prior to the start of field activities and will maintain a copy at the Site at all times during work activities. The Contractors' Health & Safety Plan will comply with all applicable OSHA regulations including 29 CFR 1910: Occupational Safety and Health Standards and 29 CFR 1926: Health and Safety Regulations for Construction. The plan will, at a minimum, address the following elements:

- Key Personnel
- Air Monitoring
- Health and Safety Risks
- Site Control
- Training Documentation
- Decontamination
- Protective Equipment
- Emergency Response
- Medical Surveillance

Contractor's employees and subcontractors performing work on this project involving excavation, movement, or treatment of solid waste or contaminated media will be required to have appropriate training as specified in the OSHA standards, including HAZWOPER Standard 29 CFR 1910.120. All work is to be performed in Level D personal protective equipment, but the contractor will have capability to upgrade to Level C.

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6.4 Sampling and Analysis Plan

If soil and wastewater samples need to be collected, the following criteria will be followed:

- Analysis of environmental media samples will be performed by an analytical laboratory included in the USEPA-approved RI/FS Multi-Site QAPP – Revision 2 (Submitted to the USEPA in 2007). The approved laboratories anticipated for use are STAT Analysis, Pace Analytical, and Test America.
- All samples for laboratory analysis will be collected in laboratory-supplied containers.
- Each cooler of samples will contain a temperature blank and trip blank for BTEX (as appropriate) to demonstrate proper sample preservation and handling.
- All QA/QC required by the analytical method will be completed. Lab QA/QC summary and chain of custody documentation will be submitted with analytical results.

Soil and water sampling procedures and analytical methods will be in accordance with the USEPAapproved RI/FS Multi-Site QAPP – Revision 2 (Submitted to the USEPA in 2007).

6.4.1 Pre-Disposal Sampling

If required by Waste Management, pre-disposal samples of excavated soils will be collected prior to disposal to verify that MGP source material soils are not above the Subtitle D landfill requirements. If soils are above landfill requirements and require amendment, the soils will either be managed onsite with ISS or samples will be collected following amendment to document that landfill requirements are met. These samples will be submitted to a laboratory for TCLP of total benzene analysis.

6.4.2 Wastewater

If wastewater is generated, wastewater samples will be collected in accordance with NSSD requirements prior to discharge to the sanitary sewer. Samples will be analyzed for the parameters specified by NSSD to confirm concentrations are below the discharge limits required by the permit.

6.5 ISS Construction Quality Assurance Plan

During ISS construction, a CQA plan will be implemented to ensure the ISS columns are constructed to meet the design performance goals. A preliminary CQA Plan is provided in Table 4. This plan will be revised, if necessary, following ISS treatability study completion and provided as a report addendum submitted in fall 2012. Since the treatability study will correlate leaching performance to the physical parameters of the mix design (UCS and hydraulic conductivity), the CQA program will evaluate the physical parameters and no leach testing or durability tests will be performed during the removal action. 2088 North Plant RAWP 120921



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The CQA plan implemented during full-scale ISS construction will likely include collection of one CQA sample for every 1,000 cubic yards treated or once each day of ISS treatment, and collection of one CQA sample for every 200 linear feet along the treatment area perimeter to ensure compliance with the design parameters. Any ISS columns that do not meet the mix design parameters will be documented and retreated if necessary.





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7 SCHEDULE

7.1 Schedule for Construction

Construction activities are tentatively scheduled to begin in winter 2012-2013 subject to review and approval of this RAWP by the USEPA, issuance of a final Administrative Order on Consent, and governmental approvals. Property access and contractor availability are not expected to be constraints with respect to the project schedule; however, weather conditions may influence the production rate of the work.

The table below summarizes the estimate construction schedule based on the planned scope of work.

Activity	Duration (Weeks)
Target Project Start Date	Winter 2012-2013
Mobilization / Site Preparation	4
ISS and Shallow Excavation	52
ISS Swell Management	· 4
Site Restoration/Close Out	4
Contingency	4
Total Estimated Project Duration	68 (1.30 Years)
Target Completion	Winter 2013

Preliminary Construction Schedule

Assumptions: A prudent estimate for typical ISS/excavation construction assumes approximately 1,000 cubic yards/day; which was utilized for this schedule. Additional production can be achieved by utilizing 2 ISS rigs, this size of this site makes it a candidate for 2 operations. An estimate of 260,100 cubic yards of remediation is assumed.

7.2 Completion Report

A Removal Action Completion Report will be submitted to USEPA within 90 days following restoration of the Site.

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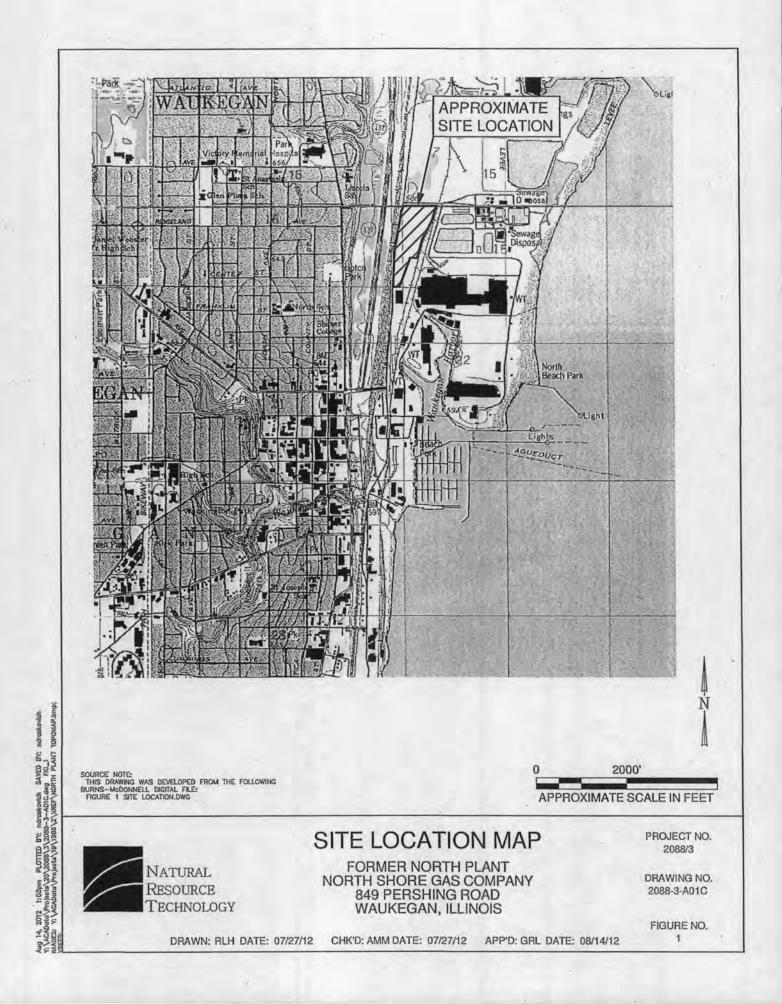
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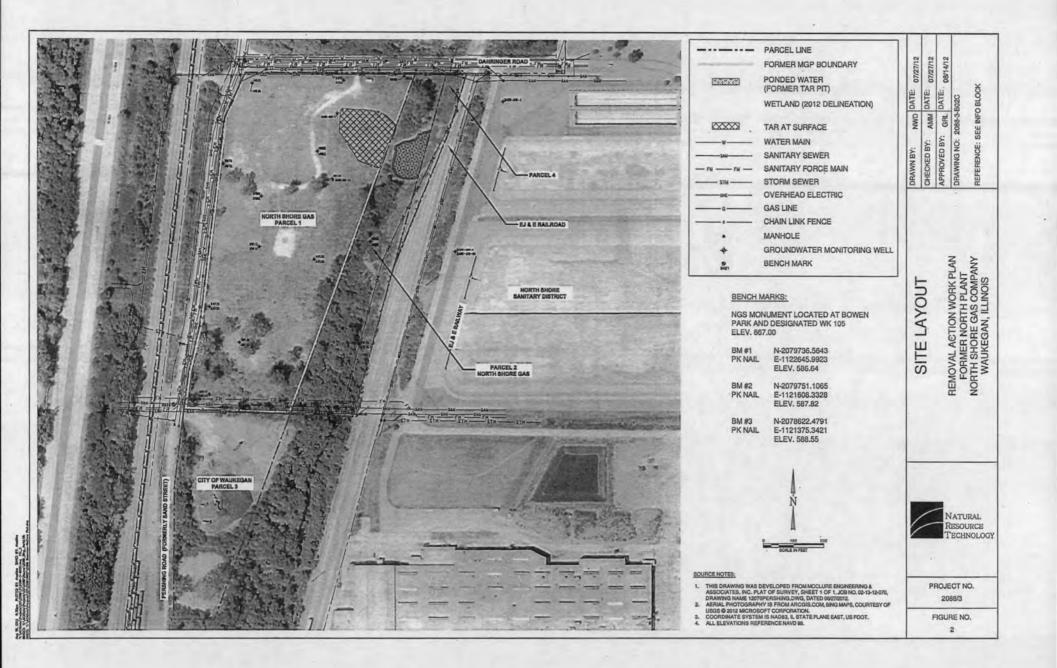
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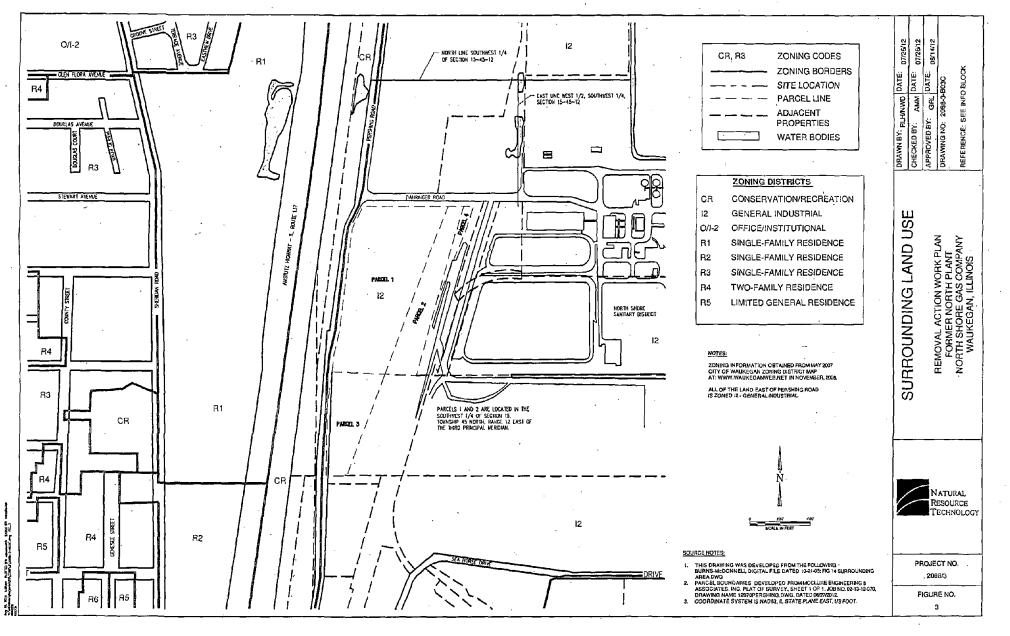


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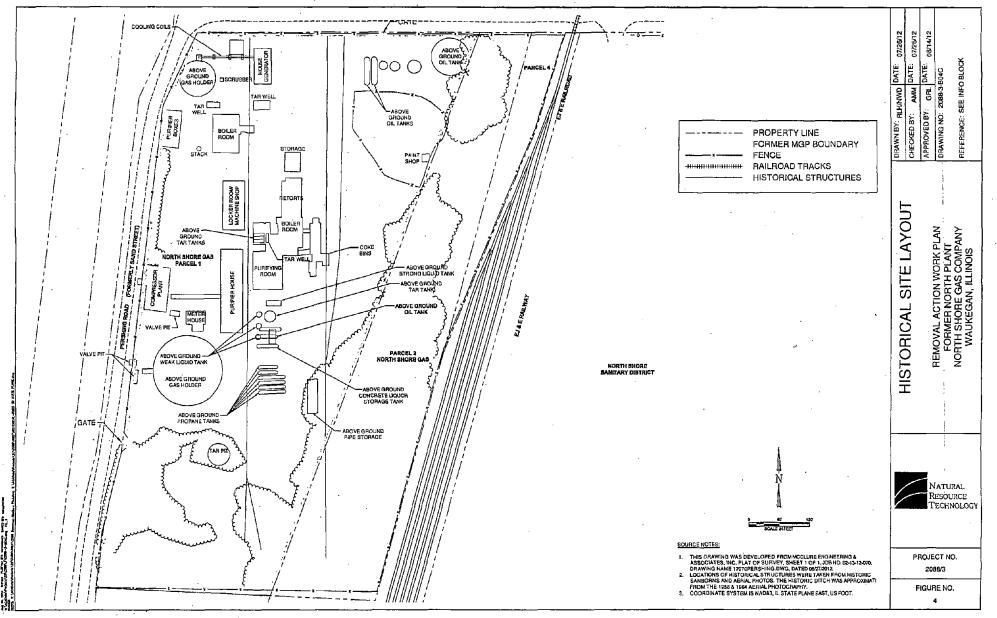


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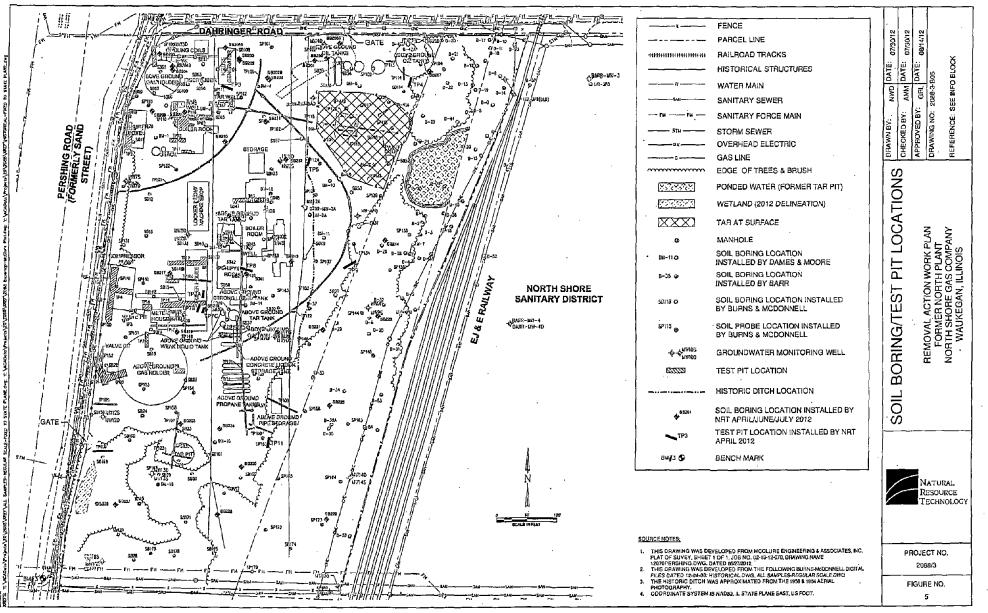


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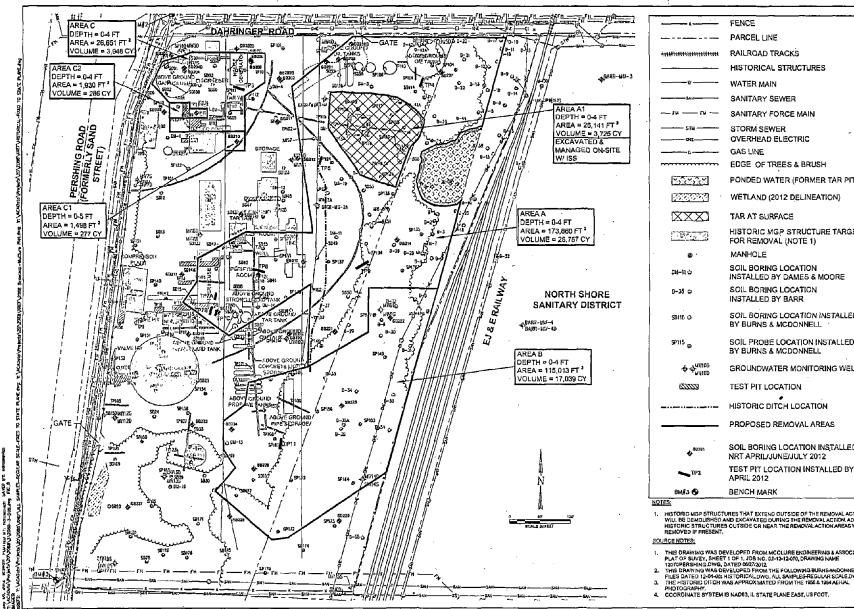


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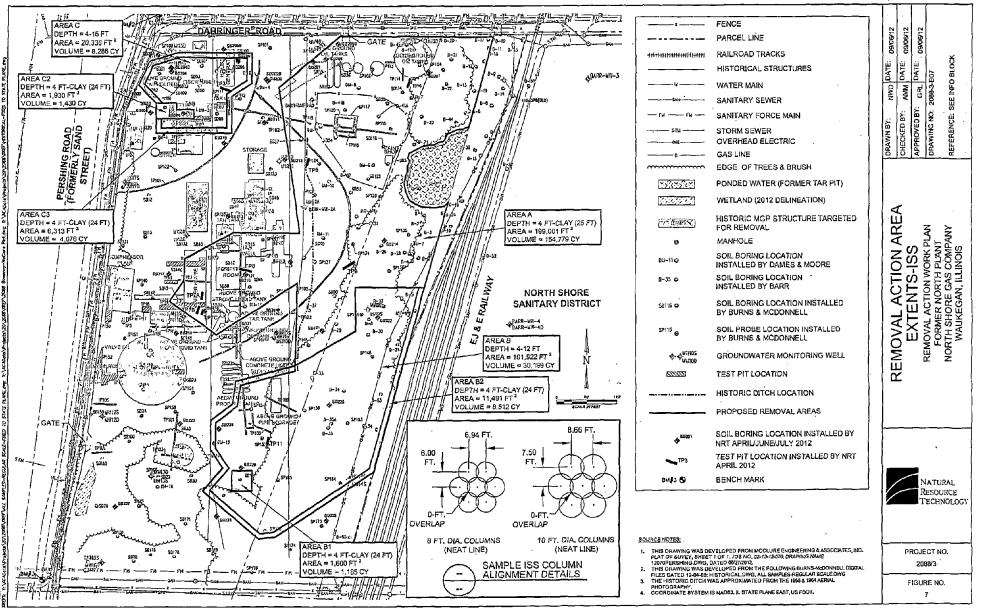
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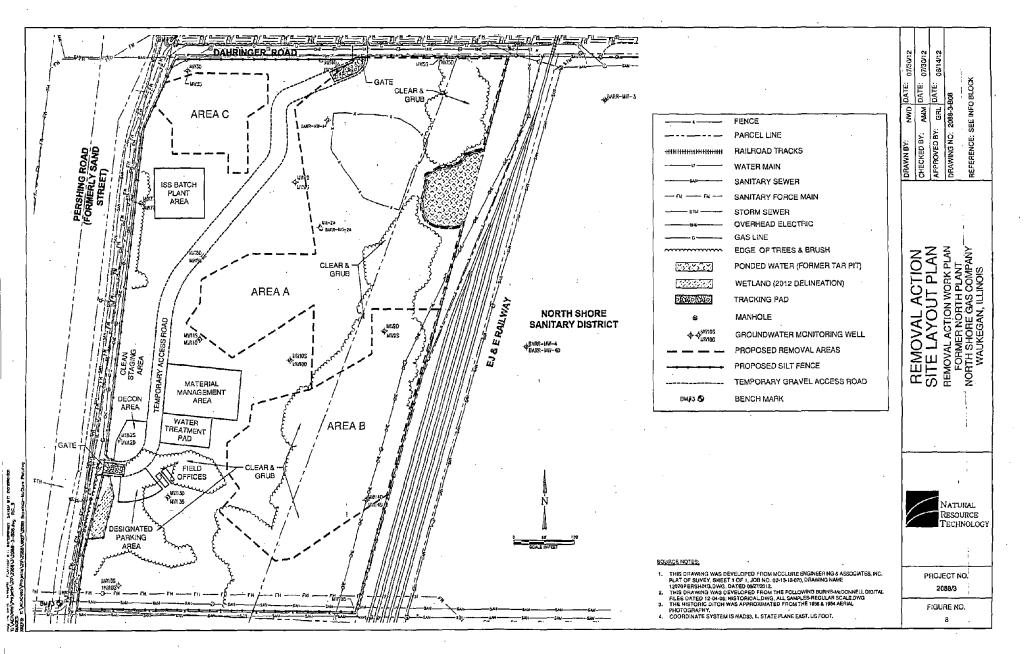
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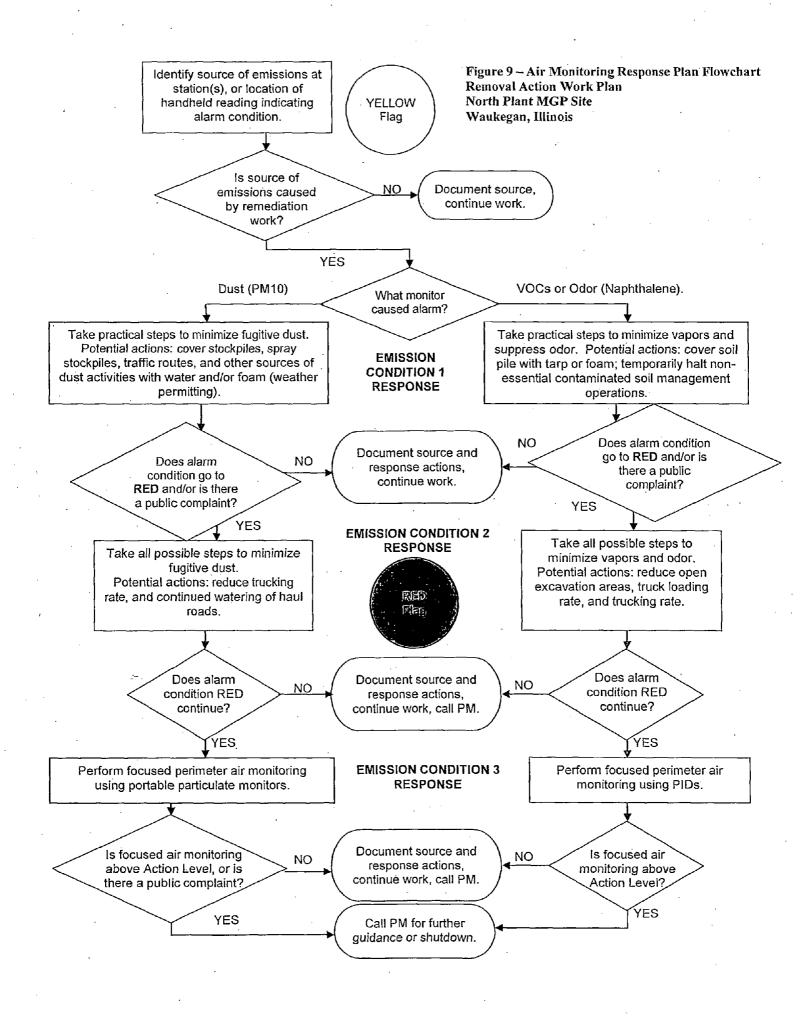


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FIGURE NO. 6







TABLES

Table 1. Pre-Removal Site Characterization Data Removal Action Work Plan North Plant MGP Site Waukegan, Illinois

Sample Location	Sample Depth (ft)	Sample Depth (ft) Sample Date Diesel Range Organics ¹ (mg/kg)		Gasoline Range Organic ¹ (mg/kg)	Total Petroleum Hydrocarbons ² (mg/kg)	
SB201	10-12	04/23/12	997	< 37.5	997	
SB200	10-12 [.]	04/23/12	3,650	15.4	3,665	
SB206	13-14	06/20/12	125	< 4.8	125	
SB206B	6-8	06/20/12	6,600	< 41.5	6,600	
\$B202B	6-8	06/21/12	1,070	13.2	1,083	
SB205	8-10	06/21/12	1460	< 4,6	1,460	
SB205B	5-6	06/21/12	861	< 4.8	. 861	
SB209	8-9	06/22/12	144	< 4.8	144	
SB208	11-12	06/22/12	· 444	< 4.8	444	
SB210	2-3	06/25/12	119,000	< 304	119,000	
SB207	23-24	06/25/12	90.9	< 5	90.9	
SB220	13-14	06/28/12	5.2	< 4.8	5.2	
SB224	6-8	06/28/12	70,100	< 6160	70,100	
SB223	6-8	06/29/12	4.1	< 5.1	4.1	
SB226	11-12	06/29/12	7.8	< 5	7.8	

Notes:

1. DRO and GRO analyzed by EPA Method 8015B Modified.

2. TPH is reported as the sum of DRO and GRO.

3. < 37.5 indicates concentrations are below the reported limit of dectection.

4. 3,665 indicates concentrations above the default value of 2,000 mg/kg for soil attenuation capacity in accordance with Illinois TACO: 35 IAC 742.215.



Table 2. ISS Treatability Study Physical Testing Summary Removal Action Work Plan North Plant MGP Site Waukegan, Illinois

Activity	Category	Test Description	QTY of Mixes Tested	QTY (Tests/Molds /Procedures)	Number of Soi Types
As Received Soil	Taskas	ASTM D2216 Moisture Content		1	1.
As Received Sol	Testing	ASTM D2937 Mcdified Bulk Density (1 point Proctor @ as-received Moisture Content)		1	1 1
		ASTM D2487 USCS		1	1
Bulk Soil Material (Prior To Screening)	Testny	ASTM D422 Particle Size Analysis (with Hydrometer)		1	1
		ASTM D4318 Atterberg Limits		xxss (Tests/Molds /Procedures) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 10 3 3 1 1 1	1
Soil Composite Sample Preparation	Preparation	Screening & Compositing Soil Samples Buckets		8	1
Soli Composite Sample Preparation	Preparation	Screening & Compositing Samples	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		1
		Mix Design Preparation	3	1	1
	Preparation	Specimen Preparation (3 UCS/3 Perm, 1 ANS 16.1, 1 Penetrometer, 2 Spare)	3	10	1
	•	Specimen Preparation (Durability) 2 test, 2 control, 1 Moisture Content per each test D4842/D4843	3	10	1
		ASTM D1633 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders	1	3	1
Cement/GGBFS Mixes (Mix 1-3)		ASTM D5084 Hydraulic Conductivity	1		1
	Phase I Testing	ASTM D2216 Moisture Content	3	1	1
		Pocket Peneirometer Measurements after 3 days of curing	3	4	1
		ASTM D1633 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders	1	1	1
	Phase II Testing	ASTM D5084 Hydraulic Conductivity	1	· 1	1
		Mix Design Preparation	4	1	1
	Preparation	Specimen Preparation (3 UCS/3 Parm, 1 ANS 16.1, 1 Penetrometer, 2 Spare)	4	10	1
	· · · · · · · · · · · · · · · · · · ·	Specimen Preparation (Durability) 2 test, 2 control, 1 Moisture Content per each test D4842/D4843	4		1
		ASTM D1633 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders	2	3	· 1
Cement/Bentonite Mixes (Mix 4-7)		ASTM D5084 Hydraulic Conductivity		3	1
	Phase I Testing	ASTM D2216 Moisture Content	4	4	
	Phase II Testing	Pocket Penetrometer Measurements after 3 days of curing	4	1	1
· · · -		ASTM D1633 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders	1	1	1 1
		ASTM D5084 Hydraulic Conductivity	1	1	
		Mix Design Preparation	3	1	1
	Preparation	Specimen Preparation (3 UCS/3 Perm, 1 ANS 16.1, 1 Penetrometer, 2 Spare)	3	10	1
		Specimen Preparation (Durability) 2 test, 2 control, 1 Molsture Content per each test D4842/D4843	3	10	1
		ASTM D1633 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders	1	3	1 1
Cement/GGBFS/Bentonite Mixes		ASTM D5084 Hydraulic Conductivity	1	3	1
(Mix 8-10)	Phase Testing	ASTM D2216 Maisture Content	3	4	
		Pocket Penetrometer Measurements after 3 days of curing	3	1	1
		ASTM D1633 Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders	1	1	1 1
	Phase II Testing	ASTM D5084 Hydraulic Conductivity	1		1
	<u> </u>	ANSI/ANS-16,1: Preparation of leachate and stake observation	2		1
		ISS Leachate Testing	2		1
	_* .	ASTM D4843M Standard Test Method for Wetting and Drying Test of Solid Wastes	2		1
Final Testing (Mix 1 and 2)	Testing	ASTM D4842M Standard Test Method for Determining the Resistance of Solid Wastes to Freezing and Thewing	2	1	1
,		Volume Expansion Calculation	2		

Page 1 of 1

Contra a

Table 3. ISS Treatability Study Leachate Data Summary Removal Action Work Plan North Plant MGP Site Waukegan, Illinois

Leach Start: July 31, 2012 Leach Interval Complete:

·	Annalist	1		F	Time (Days)									
Parameter	Analytical	Design Goals'	Pace MOL	Pace RL	0.08	0,3	1 1	2	3	4	5	19	47	90
	Mothod	(ug/L)	1							<u> </u>	<u> </u>			1
	<u>_</u>	•	· · · · · ·	···		Inorganics	(ug/L)	<u> </u>	·	·····		·	<u>.</u>	<u></u>
Arsenic, Total	6020A	10	0.1170	1.0	TBD	TSD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Chromium, Total	6020A	100	0,1060	1.0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Copper, Total	6020A	660	0.1900	1.0	TED	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Lead, Total	6020A	7.5	0.1320	1.0	TBD	TBD	TBD	TBD	TBD_	TBD	TED	TBD	TBD	TBD
Mercury, Total	7470A	5	0.1000	0,2	TED	780	TBD	180	TBD	TBD	TBD	TBD	TBD	TBD
Nickel, Tolal	6020A	100	0,1130	1,0	TBO	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Zinc, Total	6020A	5,000	1,5660	10.0	TBD	TBO	TBD	TBD	тво	TBD	TBD	TBD	TBD	TBD
Cyanide, Total	9010B/9012A	NS	4.2600	20.0	TBD	TBD	TBD	TBD	TED	TBD	TBD	TBD	TBD	TBD
Cyanide, Amenable	9010B/9012A	200	4,2600	20,0	TBD	T80	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
					Volat	ile Organic Co		L)						
Benzene	8260B	5	0.41	1,0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	CBT	TBD	TBD
cls-1,2-Dichloroethena	8260B	70	0.83	1.0	TED	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
1,1-Dichioroethane	- 8260B	700	0.75	1.0	TBD	TBD	TBD	TBD	TBD	18D	TBD	TBD	TBD	TBD
Ethylbenzene	8260B	700	0.54	1,0	TBD	T80	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Toluene	8250B	1,000	0.67	1,0	TED	TBD	TBD	TBD	TBD	твр	780	TBD	TBD	TBD
Vinyi Chloride	82609	2	0,18	1.0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	T80	TBD
Xylenes, Total	8250B	10,000	2.60	3,0	TBD	TBD	TBD	TBD	CBT	TBD	TBD	TBD	TBD	TBD
				Sen	ni-Volatile Org	anic Compour	ds, Excluding	PAHs (ug/L)						
Bis(2-ethylhexyl)phthalate	8270C	6	2.5970	5,0	TBD	TBD	TBD	TBD	TBD	T8D	TBD_	TBD	TBD	TBD
Carbazole	82700	NS	0.8949	5,0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Dibenzoluran	8270C	5,8	1.0579	5.0	Def	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
2,4-Dimethylphenol	8270C	140	1.1275	5,0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
4-Melhylphenol	8270C	NS NS	0.7674	5,0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Phenal	8270C	100	1.0343	5,0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
		_			Polycycl	ic Aromatic Hy	drocarbons (L	ig/L)						
Acenaphihene	8270 by HVI	420	0.00480	0.05	TBD	TBD	TBD	TBD	180	TBD	TBD	TBO	TBD	TBD
Acenaphthylena	6270 by HVI	420	0,00382	0.05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Anthracene	8270 by HVI	2,100	0.00608	0,05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Benzo(a)anthracene	8270 by HVI	0,13	0.00384	0.05	TBD	TED	TBD	TBD	TBO	TBD	TBD	TBD	79D	TBD
Benzo(a)pyrene	8270 by HVI	0.20	0.00303	0.05	THD	TBD	TBD	DBT	TBD	TBD	TBD	TBD	TBD	TBD
Benzo(b)fluoranthena	8270 by HVI	0,18	0,00300	0,05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Benzo(ghi)perylene	8270 by HVI	210	0.00360	0,05	TBD	TBD	16D	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Benzo(k)Iluoranthene	8270 by HVI	0,17	0.00463	0.05	TBD	TBD	TBD	TBD	TBD	TBD	TBD_	TBD	TBD	TBD
Chrysene	8270 by HVI	1.5	0,00369	0,05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Dibenz(a,h)anthracene	8270 by HVI	0,30	0,00339	0,05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Fuoranihene	8270 by HVI	280	D.00487	0,05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Fluorene	8270 by HVI	280	0.00508	0.05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Indeno(1,2,3-cd)pyrene	8270 by HVI	0.43	0.00496	0.05	TBD	TBD	TBD	TBD	TBD	TBD		TBD	TBD	TBD
2-Melhylnaphthalene	8270 by HVI	27	0.00409	0.05	TBD	TED	TBD	TBD	TSD	TBD	TBD	TBD	TBO	TBD
Naphinalene	8270 by HVI	140	0.00514	0.05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Phenenthrene	8270 by HVI	2,100	0.00858	0,05	TBD	TBD	TBD	TBD	TBD	TBD	TBD_	TBD	TBD	TBD
Pyrene	8270 by HVI	210	0.00503	0.05	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

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Notes TBD - Concentration to be determined following leach testing interval sempling and analysis. 1. Design Goals based on USEPA MCL, IEPA Taco Tier 1, or USEPA RSL as established by multi-site screening levels (June 2012) based on the May 2012 update to the EPA RSLs.

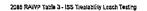




Table 4. ISS Performance Goals and Preliminary Construction Quality Assurance Plan Removal Action Work Plan North Plant MGP Site Waukegan, Illinois

Work	Test Description	Test Standard ¹	Field Sampling Frequency	Estimated Total Number of CQA Samples ²	ISS Performance Goal ³	QA Acceptance Criteria ⁴
Pilot Scale ISS	Hydrautic Conductivity	ASTM D5084	1 sample per Pilot Scale Evaluation (Three pilot scale areas with a minimum of two columns at each to be performed. Additional samples may be collected from additional columns if they are needed based on significant changes in mix design or site soils.)	3	≤1 x 10 ⁻⁶ cm/s @ 7 days	s1 x 10 ⁻⁶ cm/s @ 28 days
Evaluation	Unconlined Compressive Strength (UCS)	ASTM D1633	I sample per Pilot Scale Evaluation (Three pilot scale areas with a minimum of two columns at each to be performed. Additional samples may be collected from additional columns if they are needed based on significant changes in mix design or site soils.)	3	٤50 psl @ 7 days	≿50 psi @ 28 days
Full Scale ISS	Hydraulic Conductivity	ASTM D5084	1 sample every 1,000 cubic yards or once per day for standard cure @ 7 days (213 samples) 1 sample every 200 linear fact around the perimeter of ISS area for standard cure @ 28 days (20 additional sample). - Approximately half may be analyzed following 28 day cure, even if passing results are indicated after 7 day cure.	233	Evaluated @ 7 days ≤1 x 10 [®] cm/s @ 28 days	Geometric mean of hydraulic conductivity s 1x10 ⁻⁶ cm/s with no single sample greater than 5x10 ⁻⁶ cm/s
Operations	Uncanfined Compressive Strength (UCS)	ASTM D1633	1 sample every 1,000 cubic yards or once por day for standard cure @ 7 days (213 samples) 1 sample every 200 linear feet around the perimeter of ISS area for standard cure @ 28 days (20 additional sample). - Approximately half may be analyzed following 28 day cure, even if passing results are indicated after 7 day cure.	233	Evaluated @ 7 days ≿50 psi @ 28 days	Average UCS ≥ 50 psi with no single sample less than 40 psi

Notes:

1. Prior to testing, all mold specimens will be cured following ASTM 2632, Standard 7-day and 28-day cure.

2. Sample quantity collected shall be adequate to perform the listed ASTM standard tests plus additional spare molds.

3, ISS performance goals apply prior to completion of 50% of ISS columns.

4. QA acceptance criteria apply after 50% completion of ISS columns.

AWP Table 4 - IS3 CQA

. Page 1 of 1 .

APPENDIX A

PRE-REMOVAL SITE CHARACTERIZATION DATA

APPENDIX A1

LABORATORY ANALYTICAL REPORTS

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May 11, 2012

Glenn Luke Natural Resource Technologies 23713 W Park Rd Pewaukee, WI 53072

RE: Project: 2088 NORTH PLANT MGP Pace Project No.: 4059458

Dear Glenn Luke:

Enclosed are the analytical results for sample(s) received by the laboratory on April 27, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely

Brian Basten

brian.basten@pacelabs.com Project Manager

Enclosures

cc: Brian Hennings, NATURAL RESOURCE TECHNOLOGY



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CERTIFICATIONS

Project:2088 NORTH PLANT MGPPace Project No.:4059458

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302 Florida/NELAP Certification #: E87948 Illinois Certification #: 200050 Kentucky Certification #: 82 Louisiana Certification #: 04168 Minnesota Certification #: 055-999-334 New York Certification #: 11888 North Carolina Certification #: 503 North Dakota Certification #: R-150 South Carolina Certification #: 83006001 US Dept of Agriculture #: S-76505 Wisconsin Certification #: 405132750

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SAMPLE SUMMARY

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4059458

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4059458001	042312001	Solid	04/23/12 08:50	04/27/12 09:25
4059458002	042312002	` Solid	04/23/12 13:30	04/27/12 09:25
4059458003	042512001	Water	04/25/12 14:30	04/27/12 09:25
4059458004	TRIP042512	Water	04/25/12 14:30	04/27/12 09:25

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SAMPLE ANALYTE COUNT

Project:	2088 NORTH PLANT MGF	>
Pace Project No :	4059458	

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4059458001 042312001	EPA 8015B Modified	,нмн	2	
· .		EPA 8015B.Modified	PMS	1
		ASTM D2974-87	LTI	1
4059458002	042312002	EPA 8015B Modified	НМН	. 2
		EPA 8015B Modified	PMS	1
		ASTM D2974-87	LTI	1
4059458003	042512001	EPA 8082	BDS	10
		EPA 6010	DLB	12
	. · · ·	EPA 7470	CMS	1
		EPA 8270	RJN	70
		EPA 8260	SMT	38
		EPA 351.2	DAW	1
		EPA 365.4	DAW	ົ 1
4059458004	TRIP042512	EPA 8260	· SMT	38
	·	,		

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www.pace

PROJECT NARRATIVE

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4059458

Method:EPA 8015B ModifiedDescription:8015 GCS THC-DieselClient:Natural Resources TechnologiesDate:May 11, 2012

General Information:

2 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/14392

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- 042312001 (Lab ID: 4059458001)
 - o-Terphenyl (S)
- 042312002 (Lab ID: 4059458002)
 - o-Terphenyl (S)

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Batch Comments:

The default spike range of the standard used for QC evaluation is C10-C28. All other carbon ranges may recover outside of spike limits because they may not cover the range of the spike used. • QC Batch: GCSV / 7578

REPORT OF LABORATORY ANALYSIS

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	·	PROJECT NARRATIVE
Project: Pace Project No.:	2088 NORTH PLANT MGP 4059458	
General Information	· · ·	ceived in acceptable condition with any exceptions noted below.
Hold Time: The samples were a	analyzed within the method required hol	d times with any exceptions noted below.
Sample Preparation The samples were p	on: prepared in accordance with EPA 3510 v	with any exceptions noted below.
	(including MS Tune as applicable): nin method requirements with any excep	tions noted below.
Continuing Calibra All criteria were with	ation: nin method requirements with any excep	tions noted below.
Surrogates: All surrogates were	within QC limits with any exceptions no	ted below.
Method Blank: All analytes were be	elow the report limit in the method blank	with any exceptions noted below.
Laboratory Contro All laboratory contro	ol Spike: ol spike compounds were within QC limit	ts with any exceptions noted below.
Matrix Spikes: All percent recoveri	es and relative percent differences (RPE	Ds) were within acceptance criteria with any exceptions noted below.
Duplicate Sample: All duplicate sample		e criteria with any exceptions noted below.
Additional Comme	ents:	
Results una window.	uing calibration is outside of method acco	eptance limits. Analyte presence below reporting limits in associated samples. the presence of analytes above reporting limits were re-analyzed in a valid

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PROJECT NARRATIVE

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4059458
	······

Method: EPA 8015B Modified

 Description:
 Gasoline Range Organics

 Client:
 Natural Resources Technologies

 Date:
 May 11, 2012

General Information:

2 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: GCV/8314

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: GCV/8311

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

• 042312001 (Lab iD: 4059458001)

• TPH (C06-C10)

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PROJECT NARRATIVE

Project: Pace Project No.:	2088 NORTH PLANT MGP 4059458				
Description: 601 Client: Natu	6010 DMET ICP, Dissolved Iral Resources Technologies 11, 2012			• • •	· .
General Informat	on:	 	 		

1 sample was analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 2088 NORTH PLANT MGP Pace Project No.: 4059458

Pace Project No. 405945

Method: EPA 7470

Description:7470 Mercury, DissolvedClient:Natural Resources TechnologiesDate:May 11, 2012

General Information:

1 sample was analyzed for EPA 7470. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 7470 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

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All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below. $\ensuremath{\rangle}$

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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. (920)469-2436

PROJECT NARRATIVE

Project: 2088 NORTH PLANT MGP Pace Project No.: 4059458	
Method: EPA 8270 Description: 8270 MSSV Semivolatile Organic Client: Natural Resources Technologies Date: May 11, 2012	
General Information: 1 sample was analyzed for EPA 8270. All samples were received in acceptable condition with any exceptions noted below.	·
Hold Time: The samples were analyzed within the method required hold times with any exceptions noted below.	
Sample Preparation: The samples were prepared in accordance with EPA 3510 with any exceptions noted below.	
Initial Calibrations (including MS Tune as applicable): All criteria were within method requirements with any exception's noted below.	
Continuing Calibration: All criteria were within method requirements with any exceptions noted below.	
Internal Standards: All internal standards were within QC limits with any exceptions noted below.	
Surrogates: All surrogates were within QC limits with any exceptions noted below.	
QC Batch: OEXT/14368 S4: Surrogate recovery not evaluated against control limits due to sample dilution. • 042512001 (Lab ID: 4059458003) • 2,4,6-Tribromophenol (S) • 2-Fluorobiphenyl (S)	·
• 2-Fluorophenol (S) • Nitrobenzene-d5 (S) • Phenol-d6 (S) • Terphenyl-d14 (S)	
Method Blank: All analytes were below the report limit in the method blank with any exceptions noted below.	
Laboratory Control Spike: All laboratory control spike compounds were within QC limits with any exceptions noted below.	

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

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PROJECT NARRATIVE

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4059458

Method:	EPA 8270
Description:	8270 MSSV Semivolatile Organic
Client:	Natural Resources Technologies
Date:	May 11, 2012

Additional Comments:

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PROJECT NARRATIVE

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4059458

 Method:
 EPA 8260
 ·

 Description:
 8260 MSV

 Client:
 Natural Resources Technologies

 Date:
 May 11, 2012

General Information:

2 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable): All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: MSV/15014

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- 042512001 (Lab ID: 4059458003)
 - Dibromofluoromethane (S)

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Pace Proje	2088 NORTH PLANT MGP ct No.: 4059458		, .
Method:	EPA 351.2		
Description	n: 351.2 Diss. Kjeldahl Nitrogen		
Client:	Natural Resources Technologies		
Date:	May 11, 2012	·•	
General Inf 1 sample w	formation: as analyzed for EPA 351.2. All samples were received	in acceptable condition with any exception	ons noted below.
Hold Time:			

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 351.2 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 2088 NORTH PLANT MGP Pace Project No.: 4059458	,
Method:EPA 365.4Description:365.4 Total PhosphorusClient:Natural Resources TechnologiesDate:May 11, 2012	
General Information: 1 sample was analyzed for EPA 365.4. All samples were received in acceptable condition with any exceptions noted below.	
Hold Time: The samples were analyzed within the method required hold times with any exceptions noted below.	• •
Sample Preparation: The samples were prepared in accordance with EPA 365.4 with any exceptions noted below.	
Initial Calibrations (including MS Tune as applicable): All criteria were within method requirements with any exceptions noted below.	
Continuing Calibration: All criteria were within method requirements with any exceptions noted below.	· . ·
Method Blank: All analytes were below the report limit in the method blank with any exceptions noted below.	· · · ·
Laboratory Control Spike: All laboratory control spike compounds were within QC limits with any exceptions noted below.	
Matrix Spikes: All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.	
Duplicate Sample: All duplicate sample results were within method acceptance criteria with any exceptions noted below.	
Additional Comments: This data package has been reviewed for quality and completeness and is approved for release.	
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ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4059458

Sample: 042312001	Lab ID: 40594	58001	Collected: 04/23/1	2 08:50	Received: 04	/27/12 09:25 N	latrix: Solid	
Results reported on a "dry-weig	ht" basis						•	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8015 GCS THC-Diesel	Analytical Metho	d: EPA 80	015B Modified Prepa	ration N	lethod: EPA 3546	ŝ		
TPH - Diesel (C10-C28) Surrogates	997 mg/i	g	39.0	20	05/02/12 10:57	05/07/12 13:43		
o-Terphenyl (S)	0 %.		39-130	20	05/02/12 10:57	05/07/12 13:43	84-15-1	S4
Gasoline Range Organics	Analytical Metho	d: EPA 8	015B Modified Prepa	ration M	lethod: EPA 5035	5A/5030B		
TPH (C06-C10)	ND mg/ł	¢g	93.5	8	04/30/12 11:56	05/01/12 02:12		D3
Percent Moisture	D2974-87							
Percent Moisture	14.4 %		0.10	1		05/10/12 08:07		
					· •			
Sample: 042312002	Lab ID: 40594	58002	Collected: 04/23/1	2 13:30	Received: 04	1/27/12 09:25 M	Aatrix: Solid	· -
Results reported on a "dry-weig	ht" basis							•
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8015 GCS THC-Diesel	Analytical Metho	d: EPA 8	015B Modified Prepa	tration M	Nethod: EPA 3546	3		
TPH - Diesel (C10-C28) Surrogates	3650 mg/	٨g	116	60	05/02/12 10:57	05/07/12 14:29	ł	
o-Terphenyl (S)	0 %.		39-130	60	05/02/12 10:57	05/07/12 14:29	84-15 -1	S 4
Gasoline Range Organics	- Analytical Metho	d: EPA 8	015B Modified Prepa	aration N	Method: EPA 503	5A/5030B		
TPH (C06-C10)	15.4 mg/	kg	11.6	1	04/30/12 11:56	05/01/12 02:38		
Percent Moisture	Analytical Metho	d: ASTM	D2974-87					
Percent Moisture	13.5 %		0.10	1		05/10/12 08:07		
e e								
Sample: 042512001	Lab (D: 40594	168002	Collected: 04/25/	12 14.2) Received: 0	4/27/12 09:25	Matrix: Mater	·

Results	Units	Report Limit	DF_	Prepared	Analyzed	CAS No.	Qual
Analytical Me	thod: EPA 808	2 Preparation Met	hod: EF	PA 3510			
ND u	g/L	0.94	1	05/07/12 12:00	05/09/12 02:59	12674-11-2	
ND u	g/L	0.94	· 1	05/07/12 12:00	05/09/12 02:59	11104-28-2	
ND u	g/L	0.94	1	05/07/12 12:00	05/09/12 02:59	11141-16-5	
ND u	g/L	0.94	1	05/07/12 12:00	05/09/12 02:59	53469-21-9	
ND u	g/L	0.94	1	05/07/12 12:00	05/09/12 02:59	12672-29-6	
· ND u	g/L	0.94	1 •	05/07/12 12:00	05/09/12 02:59	11097-69-1	
ND u	g/L.	0.94	1	05/07/12 12:00	05/09/12 02:59	11096-82-5	
ND u	g/L	0.94	1	05/07/12 12:00	05/09/12 02:59	1336-36-3	
67 %	6.	10-173	1	05/07/12 12:00	05/09/12 02:59	877-09-8	
54 %	· ·	31-130	1	05/07/12 12:00	05/09/12 02:59	2051-24-3	
	Analytical Me ND u ND u ND u ND u ND u ND u ND u ND u		Analytical Method: EPA 8082 Preparation Method ND ug/L 0.94 67 %. 10-173	Analytical Method: EPA 8082 Preparation Method: EF ND ug/L 0.94 1 67 %. 10-173 1	Analytical Method: EPA 8082 Preparation Method: EPA 3510 ND ug/L 0.94 1 05/07/12 12:00 67 % 10-173 1 05/07/12 12:00	Analytical Method: EPA 8082 Preparation Method: EPA 3510 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 ND ug/L 0.94 1 05/07/12	ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 12674-11-2 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 1104-28-2 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 11104-28-2 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 11104-28-2 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 53469-21-9 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 12672-29-6 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 12672-29-6 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 11097-69-1 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 11096-82-5 ND ug/L 0.94 1 05/07/12 12:00 05/09/12 02:59 1336-36-3 67 %. 10-173 1 05/07/12 12:00 05/09/12 02:59 877-09-8

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ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4059458

Sample: 042512001	Lab (D: 405945800	3 Collected: 04/25/	12 14:30	Received: 04	/27/12 09:25	Matrix: Water	
Parameters	Results Un	its Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analylical Method: EF	A 6010					
Antimony, Dissolved	ND ug/L	20.0	1		05/03/12 12:21	7440-36-0	
Arsenic, Dissolved	ND ug/L	20.0	1		05/03/12 12:21	7440-38-2	
Beryllium, Dissolved	ND ug/L	4.0	1		05/03/12 12:21	7440-41-7	
Cadmium, Dissolved	ND ug/L	5.0	1		05/03/12 12:21	7440-43-9	
Chromium, Dissolved	ND ug/L	5.0	1		05/03/12 12:21	7440-47-3	
Copper, Dissolved	ND ug/L	10.0	1		05/03/12 12:21	7440-50-8	
Lead, Dissolved	ND ug/L	7.5	1		05/03/12 12:21	7439-92-1	
Nickel, Dissolved	ND ug/L	10.0	1	· ·	05/03/12 12:21	7440-02-0	
Selenium, Dissolved	ND ug/L	20.0	1		05/03/12 12:21	7782-49-2	•
Silver, Dissofved	ND ug/L	10.0	1		05/03/12 12:21	7440-22-4	
Thallium, Dissolved	ND ug/L	40.0	1		05/03/12 12:21	7440-28-0	
Zinc, Dissolved	ND ug/L	√ 40.0	1		05/03/12 12:21	7440-66-6	
7470 Mercury, Dissolved	Analytical Method: EF	A 7470 Preparation Met	hod: EP/	A 7470			
Mercury, Dissolved	ND ug/L	0.20	1	05/02/12 18:47	05/03/12 15:55	5 7439-97-6	
8270 MSSV Semivolatile Organic	Analytical Method: EF	A 8270 Preparation Met	hod: EP/	A 3510		•	
Acenaphthene	591 ug/L	472	100	05/01/12 12:00	05/02/12 14:43	83-32-9	
Acenaphthylene	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	208-96-8	
Anthracene	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	120-12-7	
Benzo(a)anthracene	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	56-55-3	
Benzo(a)pyrene	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	50-32-8	
Benzo(b)fluoranthene	'ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	205-99-2	
Benzo(g.h.i)perylene	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	191-24-2	
Benzo(k)fluoranthene	. ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	207-08-9	
4-Bromophenylphenyl ether	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	101-55-3	
Butylbenzylphthalate	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	85-68-7	
Carbazole	ND ug/L	. 472	100	05/01/12 12:00	05/02/12 14:43	8 86-74-8	
4-Chloro-3-methylphenol	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	59-50-7	
4-Chloroaniline	· ND ug/L	472	100 -		05/02/12 14:43		· .
bis(2-Chloroethoxy)methane	ND ug/L	. 472	100	05/01/12 12:00	05/02/12 14:43	3 111-91-1	
bis(2-Chloroethyl) ether	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	111-44-4	
2-Chloronaphthalene	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	91-58-7	
2-Chlorophenol	ND ug/L	472	100	05/01/12 12:00	05/02/12 14:43	95-57-8	
4-Chlorophenylphenyl ether	ND ug/L	472	100	05/01/12 12:00			
Chrysene	ND ug/L	472	100		05/02/12 14:43		
Dibenz(a,h)anthracene	ND ug/L	472	100		05/02/12 14:43		
Dibenzofuran	ND ug/L	472	100		05/02/12 14:43		
1,2-Dichlorobenzene	ND ug/L	472	100		05/02/12 14:43		•
1,3-Dichlorobenzene	ND ug/L	472	100		05/02/12 14:43		
1,4-Dichlorobenzene	ND ug/L	472	100		05/02/12 14:43		
3,3'-Dichlorobenzidine	ND ug/L	472	100		05/02/12 14:43		
2,4-Dichlorophenol	ND ug/L	472	100	05/01/12 12:00			
Diethylphthalate	ND ug/L	472	100		05/02/12 14:43		
2,4-Dimethylphenol	ND ug/L	472	100		05/02/12 14:43		
Dimethylphthalate	NĐ ug/L	472	100	05/01/12 12:00			

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ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

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Pace Project No.: 4059458

Sample: 042512001	Lab ID: 4059	458003	Collected: 04/25/1	12 14:30	Received: 04	/27/12 09:25 N	latrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua	al
8270 MSSV Semivolatile Organic	Analytical Metho	od: EPA 8	270 Preparation Met	hod: EP/	A 3510				
Di-n-butylphthalate	ND ug/l	-	472	100		05/02/12 14:43			
4,6-Dinitro-2-methylphenol	ND ug/L	-	472	100	05/01/12 12:00	05/02/12 14:43	534-52-1		
2,4-Dinitrophenol	ND ug/l	-	943	100	05/01/12 12:00	05/02/12 14:43	51-28-5		
2,4-Dinitrotoluene	ND ug/L	-	472	100	05/01/12 12:00	05/02/12 14:43	121-14-2		
2,6-Dinitrotoluene	ND ug/t	-	472	100	05/01/12 12:00	05/02/12 14:43	606-20-2		
Di-n-octylphthalate	 ND ug/I 	-	472	100	05/01/12 12:00	05/02/12 14:43	117-84-0		
bis(2-Ethylhexyl)phthalate	ND ug/L	-	472	100	05/01/12 12:00	05/02/12 14:43	117-81-7		
Fluoranthene	ND ug/t	-	472	100	05/01/12 12:00	05/02/12 14:43	206-44-0		
Fluorene	ND ug/l	_	472	100	05/01/12 12:00	05/02/12 14:43	86-73-7		
Hexachloro-1,3-butadiene	ND ug/l	_	943	100	05/01/12 12:00	05/02/12 14:43	87-68-3	•	
Hexachlorobenzene	ND ug/l	-	472	100	05/01/12 12:00	05/02/12 14:43	118-74-1		
Hexachlorocyclopentadiene	· ND ug/l		472	100	05/01/12 12:00	05/02/12 14:43	77-47-4		
Hexachloroethane	ND ug/l		472	100	05/01/12 12:00	05/02/12 14:43	67-72-1		
Indeno(1,2,3-cd)pyrene	ND ug/l		472	100	05/01/12 12:00	05/02/12 14:43	193-39-5		
isophorone	ND ug/l	-	472	100	05/01/12 12:00	05/02/12 14:43	78-59-1		
2-Methylnaphthalene	1100 ug/l		472	100	05/01/12 12:00	05/02/12 14:43	91-57-6		
2-Methylphenol(o-Cresol)	ND ug/l		472	100	05/01/12 12:00	05/02/12 14:43	95-48-7		
3&4-Methylphenol(m&p Cresol)	ND ug/l		472	100	05/01/12 12:00	05/02/12 14:43			
Naphthalene	5150 ug/l		472	100	05/01/12 12:00	05/02/12 14:43	91-20-3		
2-Nitroaniline	ND ug/		472	100	05/01/12 12:00	05/02/12 14:43	88-74-4		
3-Nitroaniline	ND ug/l		472	100		05/02/12 14:43			
4-Nitroaniline	ND ug/l		472	100	05/01/12 12:00	05/02/12 14:43	100-01-6		
Nitrobenzene	ND ug/		472	100		05/02/12 14:43	•		
2-Nitrophenol	ND ug/		472	100		05/02/12 14:43			
4-Nitrophenol	ND ug/		943	100		05/02/12 14:43			
N-Nitroso-di-n-propylamine	ND ug/		472	100		05/02/12 14:43			
N-Nitrosodiphenylamine	ND ug/		943	100		05/02/12 14:43			
2,2'-Oxybis(1-chloropropane)	ND ug/l		472	100		05/02/12 14:43			
Pentachlorophenol	ND ug/		943	100		05/02/12 14:43			
Phenanthrene	609 ug/		472	100		05/02/12 14:43			
Phenol	ND ug/		472	100		05/02/12 14:43			
Pyrene	ND ug/		472	100		05/02/12 14:43			
1,2,4-Trichlorobenzene	ND ug/		472	100		05/02/12 14:43			
2,4,5-Trichlorophenol	ND ug/		472	100		05/02/12 14:43			
2,4,6-Trichlorophenol	ND ug/		472	100		05/02/12 14:43			
Surrogates	112 091	-				00/02/12 11:10	00 00 2		
Nitrobenzene-d5 (S)	0 %.		41-130	100	05/01/12 12:00	05/02/12 14:43	4165-60-0	S4	•,
2-Fluorobiphenyl (S)	0 %.		51-130	100		05/02/12 14:43		S4	,
Terphenyl-d14 (S)	0 %.		38-130	100		05/02/12 14:43		S 4	
Phenol-d6 (S)	0 %.		13-130	100		05/02/12 14:43		S4	
2-Fluorophenol (S)	0 %.		24-130	100		05/02/12 14:43		S4	
2,4,6-Tribromophenol (S)	0 %.		38-130	100		05/02/12 14:43		S4	
8260 MSV	Analytical Meth	od: EPA 8	260						
Acetone	ND ug/	L	1000	50		04/30/12 15:55	67-64-1		
Benzene	163 ug/		50.0	50		04/30/12 15:55			
Bromodichloromethane	ND ug/		50.0	50		04/30/12 15:55			

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ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4059458

Sample: 042512001	Lab ID: 4059	9458003	Collected: 04/25/1	2 14:30	Received: 04	/27/12 09:25 N	latrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Meth	iod: EPA 8	260					
Bromoform	ND ug	/L	. 50.0	50		04/30/12 15:55	75-25-2	
Bromomethane	ND ug/	1L	50.0	50		04/30/12 15:55	74-83-9	
2-Butanone (MEK)	ND ug/	/L	1000	50		04/30/12 15:55	78-93-3	
Carbon disulfide	ND ug/	/L	50.0	50		04/30/12 15:55	75-15-0	
Carbon tetrachloride	ND ug/	/L	50.0	50		04/30/12 15:55	56-23-5	
Chlorobenzene	ND ug/	L	50.0	50		04/30/12 15:55	108-90-7	
Chloroethane	ND ug/	/L	50.0	50		04/30/12 15:55	75-00-3	-
Chloroform	ND ug		250	50		04/30/12 15:55	67-66-3	
Chloromethane	ND ug/	/L	50.0	50		04/30/12 15:55	74-87-3	
Dibromochloromethane	ND ug/	/L	50.0	50		04/30/12 15:55	124-48-1	
1,1-Dichloroethane	ND ug/	/L	50.0	50		04/30/12 15:55	75-34-3	
1,2-Dichloroethane	ND ug/	/L	50.0	50		04/30/12 15:55	107-06-2	
1,1-Dichloroethene	ND ug/	۲L	50.0	50		04/30/12 15:55	75-35-4	
cis-1,2-Dichloroethene	ND ug/	íL	50.0	50		04/30/12 15:55	156-59-2	
trans-1,2-Dichloroethene	ND ug/		50.0	50		04/30/12 15:55		
1,2-Dichloropropane	ND ug/		50.0	50		04/30/12 15:55		
cis-1,3-Dichloropropene	ND ug/		50.0	50		04/30/12 15:55		
trans-1,3-Dichloropropene	ND ug/	/L	50.0	50		04/30/12 15:55	10061-02-6	
Ethylbenzene	833 ug		50.0	50		04/30/12 15:55	100-41-4	
2-Hexanone	ND ug		250	50		04/30/12 15:55	591-78-6	
Methylene Chloride	ND ug/		50.0	50		04/30/12 15:55		
4-Methyl-2-pentanone (MIBK)	ND ug/		250	50		04/30/12 15:55	108-10-1	
Methyl-tert-butyl ether	ND ug/		50.0	50		04/30/12 15:55		•
Styrene	ND ug/		50.0	50		04/30/12 15:55		
1,1,2,2-Tetrachloroethane	ND ug/		50.0	50		04/30/12 15:55		
Tetrachloroethene	ND ug/		50.0	50		04/30/12 15:55		
Toluene	ND ug/		50.0	50		04/30/12 15:55		
1,1,1-Trichloroethane	ND ug/		· 50.0	50		04/30/12 15:55		
1,1,2-Trichloroethane	ND ug/		50.0	50		04/30/12 15:55		
Trichloroethene	ND ug/		50.0	50		04/30/12 15:55		
Vinyl chloride	ND ug/		50.0	50		04/30/12 15:55		
Xylene (Total)	432 ug/		150	50		04/30/12 15:55		
Surrogates				- •				
4-Bromofluorobenzene (S)	81 %.		70-130	50		04/30/12 15:55	460-00-4	
Dibromofluoromethane (S)	100 %.		70-130	50		04/30/12 15:55	1868-53-7	D3
Toluene-d8 (S)	89 %.	•	70-130	50		04/30/12 15:55		
351.2 Diss. Kjeldahl Nitrogen	Analytical Meth	iod: EPA 3	51.2 Preparation Met	hod: EP/	A 351.2			
Nitrogen, Kjeldahl, Total, Dissolved	2.6 mg	/L	1.0	1	05/07/12 10:00	05/07/12 14:40	7727-37-9	
365.4 Total Phosphorus	Analytical Meth	iod: EPA 3	65.4 Preparation Met	hod: EP/	A 365.4			
Phosphorus	ND mg	/L.	0.40	1	05/09/12 07:30	05/09/12 14:09	7723-14-0	

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ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4059458

Sample: TRIP042512	Lab ID: 40594580	004 Collected: 04/25/1	2 14:30	Received: 04/27/12 09:2	25 Matrix: Water	
Parameters	Results U	nits Report Limit	DF	Prepared Analyz	ed CAS No.	Qual
8260 MSV	Analytical Method: E	EPA 8260				
Acetone	ND ug/L	20.0	1	04/30/12	12:30 67-64-1	
Benzene	ND ug/L	1.0	1	04/30/12	12:30 71-43-2	
Bromodichloromethane	ND ug/L	. 1.0	1	04/30/12	12:30 75-27-4	
Bromoform	ND ug/L	1.0	1	04/30/12	12:30 75-25-2	
Bromomethane	ND ug/L	1.0	1	04/30/12	12:30 74-83-9	·
2-Butanone (MEK)	ND ug/L	20.0	1	04/30/12	12:30 78-93-3	
Carbon disulfide	ND ug/L	1.0	1	04/30/12	12:30 75-15-0	
Carbon tetrachloride	ND ug/L	· 1.0	1	04/30/12	12:30 56-23-5	
Chlorobenzene	ND ug/L	1.0	1	04/30/12	12:30 108-90-7	
Chloroethane	ND ug/L	1.0	1	04/30/12	12:30 75-00-3	
Chloroform	ND ug/L	· 5.0	1	04/30/12	12:30 67-66-3	
Chloromethane	ND ug/L	1.0	1	04/30/12	12:30 74-87-3	
Dibromochloromethane	ND_ug/L	1.0	1	04/30/12	12:30 124-48-1	
1,1-Dichloroethane	ND ug/L	1.0	1	04/30/12	12:30 75-34-3	
1,2-Dichloroethane	ND ug/L	1.0	1		12:30 107-06-2	
1,1-Dichloroethene	ND ug/L	1.0	1	04/30/12	12:30 75-35-4	
cis-1,2-Dichloroethene	ND ug/L	1.0	1	04/30/12	12:30 156-59-2	
trans-1,2-Dichloroethene	ND ug/L	_ 1.0	1	04/30/12	12:30 156-60-5	
1,2-Dichloropropane	ND ug/l.	1.0	1	. 04/30/12	12:30 78-87-5	
cis-1,3-Dichloropropene	ND ug/L	1.0	1	04/30/12	12:30 10061-01-5	
trans-1,3-Dichloropropene	ND ug/L	1.0	1		12:30 10061-02-6	
Ethylbenzene	ND ug/L	1.0	1		12:30 100-41-4	
2-Hexanone	ND ug/L	5.0	1		12:30 591-78-6	
Methylene Chloride	ND ug/L	1.0	1		12:30 75-09-2	
4-Methyl-2-pentanone (MIBK)	ND ug/L	5.0	1		12:30 108-10-1	•
Methyl-tert-butyl ether	ND ug/L	1.0	1		12:30 1634-04-4	-
Styrene	ND ug/L	1.0	1		12:30 100-42-5	
1,1,2,2-Tetrachloroethane	ND ug/L	1.0	1		12:30 79-34-5	
Tetrachloroethene	ND ug/L	1.0	1		12:30 127-18-4	
Toluene	ND.ug/L	1.0	1		12:30 108-88-3	
1.1.1-Trichloroethane	ND ug/L	1.0	1		12:30 71-55-6	
1,1,2-Trichloroethane	ND ug/L	1.0	1		12:30 79-00-5	•
Trichloroethene	ND ug/L	1.0	1		12:30 79-01-6	
Vinyl chloride	ND ug/L	1.0	1		12:30 75-01-4	
Xylene (Total)	ND ug/L	3.0	1		12:30 1330-20-7	
Surrogates		0.0	•	0-100112	12.00 1000-20-1	
4-Bromofluorobenzene (S)	75 %.	70-130	1	04/30/12	12:30 460-00-4	
Dibromofluoromethane (S)	99 %.	70-130	1		12:30 1868-53-7	
Toluene-d8 (S)	87 %.	70-130	1		12:30 2037-26-5	

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QUALITY CONTROL DATA

Project:	2088 NORTH PLANT MGP									
Pace Project No.:	4059458									
QC Batch:	_ GCV/8311	Analysi	is Method:	EF	PA 8015	3 Modifie	d			
QC Batch Method:	EPA 5035A/5030B	Analysi	is Descripti	on: Ga	asoline F	Range Or	ganics			
Associated Lab San	nples: 4059458001, 4059458002							•		
METHOD BLANK:	598558	N	tatrix: Solid	t						
Associated Lab San	ples: 4059458001, 4059458002									
	<i></i>	Blank	Re	porting			•			
Paran	neter Units	Result	l ·	Limit ·	Ana	lyzed	Qualifi	iers		
TPH (C06-C10)	mg/kg		ND	10.0	04/30/	12 21:30				
		i -		-						
LABORATORY CON	TROL SAMPLE & LCSD: 59855	9	59	98560						
		Spike	LCS	LCSD	LCS	LCSD	% Rec		Мах	
Paran	neter Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
TPH (C06-C10)	mg/kg	50	48.6	50.6	97	101	79-120	4	2,0	

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QUALITY CONTROL DATA

Project: 2088 NORTH PL	ANT MGP		,			
Pace Project No.: 4059458						· .
QC Batch: ICP/5882		Analysis Meth	od: EF	PA 6010		
QC Batch Method: EPA 6010		Analysis Desc	ription: IC	P Metals, Trace, Di	ssolved	
Associated Lab Samples: 4059458	003	,				
METHOD BLANK: 600288		Matrix: V	Water	· ,		• •
Associated Lab Samples: 4059458	003					
		Blank	Reporting			
Parameter	Units	Result	Limit	Analyzed	Qualifiers	
Antimony, Dissolved	ug/L	ND -	20.0	05/03/12 12:17		
Arsenic, Dissolved	ug/L	ND	20.0	05/03/12 12:17		
Beryllium, Dissolved	ug/L	ND	. 4.0	05/03/12 12:17		
Cadmium, Dissolved	ug/L	ND	5.0	05/03/12 12:17		
Chromium, Dissolved	ug/L	ND	5.0	05/03/12 12:17		
Copper, Dissolved	ug/L	ND	10.0	05/03/12 12:17		
Lead, Dissolved	ug/L	ND	7.5	05/03/12 12:17		
Nickel, Dissolved	ug/L	ND	10.0	05/03/12 12:17		
Selenium, Dissolved	ug/L	ND	20.0	05/03/12 12:17		•
Silver, Dissolved	ug/L	ND	10.0	05/03/12 12:17		
Thailium, Dissolved	ug/L ·	ND	40.0	05/03/12 12:17		
Zinc, Dissolved	ug/L	ND	40.0	05/03/12 12:17		

LABORATORY CONTROL SAMPLE: 600289

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
ntimony, Dissolved	ug/L	500	485	97	80-120	
rsenic, Dissolved	ug/L	50 0	477	95	80-120	
eryllium, Dissolved	ug/L	500	487	、	80-120	
admium, Dissolved	ug/L	500	483	97	80-120	
romium, Dissolved	ug/L	500	475	95	80-120	
pper, Dissolved	ug/L	500	474	95	80-120	-
id, Dissolved	ug/L	500	490	98	80-120	
el, Dissolved	ug/L	500	491	98	80-120	
enium, Dissolved	ug/L	500	488	98	80-120	
ver, Dissolved	ug/L	250	231	93	80-120	
allium, Dissolved	ug/L.	500	479	96	80-120	
c, Dissolved	ug/L	500	485	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 600290

600291

Parameter	4 Units	059458003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony, Dissolved	ug/L	ND	500	500	484	479	97	96	75-125	1	20	
Arsenic, Dissolved	ug/L	ND	500	500	495	491	99	98	75-125	1	20	
Beryllium, Dissolved	ug/L	ND	500	500	494	490	99	. 98	75-125	1	20	
Cadmium, Dissolved	ug/L	ND	500	500	493	486	99	97	75-125	1	20	
Chromium, Dissolved	ug/L	ND	500	500	480	476	96	95	75-125	1	20	
Copper, Dissolved	ug/L	ND	500	500	494	491	99	98	75-125	1	20	
Lead, Dissolved	ug/L	ND	500	500	490	487	98	97	75-125	1	20	

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QUALITY CONTROL DATA

Project:2088 NORTH PLANT MGPPace Project No.:4059458

MATRIX SPIKE & MATRIX S			MS	MSD	600291		MS					
Parameter	4 Units	059458003 Result	Spik e Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nickel, Dissolved			500	500	490	483	98	96	75-125	1	20	
Selenium, Dissolved	ug/L	ND	500	500	513	507	102	101	75-125	1	20	
Silver, Dissolved	ug/L	ND	250	250	228	226	91	90	75-125	1	20	
Thallium, Dissolved	ug/L	ND	500	500	. 480	478	95	95	75-125	0	20	
Zinc, Dissolved	ug/L	ND	500	500	491	487	98	97	75-125	1	· 20	

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QUALITY CONTROL DATA

Pace Project No.: 4059	NORTH PL 458	ANT MG	P									
	RP/3057 7470 4059458	, 003			is Method: is Descript		EPA 7470 7470 Mercury	v Dissolved				
METHOD BLANK: 6000	74				Matrix: Wal	er						
Associated Lab Samples:	4059458	003										
Parameter			Units	Blank Resul		eporting Limit	Analyz	red	Qualifiers			
Mercury, Dissolved	<u> </u>	ug/L			ND	0.3				 .		
LABORATORY CONTRO	. SAMPLE:	60007	5 Units	Spike Conc.	LCS Resu		LCS % Rec 、	% Rec Limits		ualifiers		
Mercury, Dissolved		ug/L		5		5.0	99		-115			
MATRIX SPIKE & MATRIX	SPIKE DU	PLICATE				600077				<u> </u>	·	
Parameter		40 Units	59458003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD RPD	Qua
Mercury, Dissolved	ug/	L	ND,	5	5	5	.0 5.1	100	101	85-115	1 20	
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QUALITY CONTROL DATA

QC Batch: MSV/	15014	Analysis Meth	nod: EF	PA 8260		•	
QC Batch Method: EPA 8	260	Analysis Dese	cription: 82	60 MSV			
Associated Lab Samples:	4059458003, 4059458004						
METHOD BLANK: 598427	· · · · · · · · · · · · · · · · · · ·	Matrix:	Water				
Associated Lab Samples:	4059458003, 4059458004						
		Blank	Reporting				
Parameter	Units	Result	Limit	Analyzed	Qualifiers		
1,1,1-Trichloroethane	ug/L	- ND	1.0	04/30/12 07:42			
,1,2,2-Tetrachloroethane	ug/L·	ND	1.0	04/30/12 07:42			
,1,2-Trichloroethane	ug/L	ND	1.0	04/30/12 07:42			
,1-Dichloroethane	ug/L	ND	1.0	04/30/12 07:42			
,1-Dichloroethene	ug/L	ND	1.0	04/30/12 07:42			
,2-Dichloroethane	ųg/L	ND	1.0	04/30/12 07:42			
,2-Dichloropropane	ug/L	. ND	1.0	04/30/12 07:42			
-Butanone (MEK)	ug/L	ND	20.0	04/30/12 07:42			
-Hexanone	ug/L	ND	5.0	04/30/12 07:42			
-Methyl-2-pentanone (MIBh	() ug/L	ND	5.0	04/30/12 07:42			
cetone	`ug/L	ND	20.0	04/30/12 07:42			
enzene	ug/L	ND	1.0	04/30/12 07:42			
Iromodichloromethane	ug/L	ND	10	04/30/12 07:42			
fromoform	ug/L	ND	1.0	04/30/12 07:42			
Sromomethane	ug/L	ND	1.0	04/30/12 07:42			
Carbon disulfide	ug/L	NĐ	1.0	04/30/12 07:42			
Carbon tetrachloride	ug/L	ND	1.0	04/30/12 07:42			
Chlorobenzene	ug/L	ND	1.0	04/30/12 07:42			
Chloroethane	ug/L	ND	1.0	04/30/12 07:42			
chloroform	ug/L	· ND	5.0	04/30/12 07:42			
Chloromethane	ug/L	ND	1.0	04/30/12 07:42			
is-1,2-Dichloroethene	ug/L	ND	1.0	04/30/12 07:42			
is-1,3-Dichloropropene	ug/L	· ND	1.0	04/30/12 07:42			
Dibromochloromethane	ug/L	ND	1.0	04/30/12 07:42			
thylbenzene	ug/L	ND	1.0	04/30/12 07:42			
lethyl-tert-butyl ether	ug/L	ND	1.0	04/30/12 07:42			
lethylene Chloride	ug/L	ND	1.0	04/30/12 07:42			
styrene	ug/L	ND	1.0	04/30/12 07:42			
etrachloroethene	ug/L	ND	1.0	04/30/12 07:42	•		
oluene	ug/L	ND	1.0	04/30/12 07:42			
ans-1,2-Dichloroethene	ug/L	ND	1.0	04/30/12 07:42			
ans-1,3-Dichloropropene	ug/L	ŅD	1.0	04/30/12 07:42			
richloroethene	ug/L	ND	1.0	04/30/12 07:42			
/inyl chloride	ug/L	ND	. 1.0	04/30/12 07:42			
ylene (Total)	ug/L	ND	3.0				
-Bromofluorobenzene (S)	%.	76	70-130				
Dibromofluoromethane (S)	%.	95	70-130	04/30/12 07:42			
oluene-d8 (S)	%.	90	70-130	04/30/12 07:42			

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QUALITY CONTROL DATA

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Project: 2088 NORTH PLANT MGP Pace Project No .: 4059458

LABORATORY CONTROL SAMPL	E & LCSD: 59842	8	59	8429						
•		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
1,1,1-Trichloroethane	ug/L	50	63.0	62.5	126	125	70-133	1	20	
1,1,2,2-Tetrachloroethane	ug/L	50	50.7	51.0	101	102	70-130	<u>,</u> 1	20	
1,1,2-Trichloroethane	ug/L	50	53.6	5 3 .9	107	108	70-130	· 1	20	
1,1-Dichloroethane	ug/L	50	63.8	65.2	128	130	70-130	2	20	
1,1-Dichloroethene	ug/L	50	50.1	52.8	100	106	70-130	5	20	
1,2-Dichloroethane	ug/L	50	60.6	60.7	121	121	70-145	0	20	
1,2-Dichloropropane	ug/L	50	61.4	62.1	123	124	70-130	1	20	
2-Butanone (MEK)	ug/L	50	57.3	58.9	115	118	50-150	3	20	
2-Hexanone	ug/L	50	51.8	51.5	104	103	50-150	1	20	
1-Methyl-2-pentanone (MIBK)	ug/L	50	50.9	51.6	102	103	50-150	1	20	
Acetone	ug/L	50	64.8	68.3	130	137	50-150	5	20	
Benzene	ug/L	50	62.1	63.3	124	127	70-130	2	20	
Bromodichloromethane	ug/L	50	58.1	56.6	i 116	113	70-130	3	20	
Bromoform	ug/L	50	45.0	43.9	90	88	70-130	3	20	
Bromomethane	ug/L	50	48.9	49.9	98	100	52-155	2	20	
Carbon disulfide	ug/L	50	52.0	55.6	104	111	70-130	7	20	
Carbon tetrachloride	. ug/L	50	70.7	70.7	141	141	70-153	0	20	
Chlorobenzene	ug/L	50	54.1	50.2	108	100	70-130	. 7	20	
Chloroethane	ug/L	50	58.3	55.6	117	111	70-130	5	20	
Chloroform	ug/L	. 50	59.8	59.8	120	120	70-130	0	20	
Chloromethane	ug/L	50	54.6	51.0	109	102	50-130	7	20	
cis-1,2-Dichloroethene	ug/L	50	57.2	57.3	114	115	70-130	0	20	
cis-1,3-Dichloropropene	ug/L	- 50	61.3	62.3	123	125	70-130	2	20	
Dibromochloromethane	ug/L	50	52.2	49.5	. 104	99	70-130	5	20	
Ethylbenzene	ug/L	50	58.2	57.1	116	114	70-130	2	20	
Methyl-tert-butyl ether	ug/L	50	58.4	59.9	117	120	70-130	3	20	
Methylene Chloride	ug/L	50	50.3	53.2	101	106	70-130	6	20	
Styrene	ug/L	. 50	53.9	49.4	108	99	70-130	9	20	
Tetrachloroethene	ug/L	50	50,8	49.6	102	99	70-130	2	20	
Toluene	ug/L	50	55.6	55.0	111	110	70-130	1	20	
trans-1,2-Dichloroethene	ug/L	50	59.0	60.3	118	121	70-130	2	20	
trans-1,3-Dichloropropene	ug/L	-50	53.7	52.9	107	106	70-130	1	20	
Trichloroethene	ug/L	50	56.6	56.2	: 113	112	70-130	1	20	
Vinyl chloride	ug/L	50	58.7	51.6			66-130	13	20	
Xylene (Total)	ug/L	150	165	162	2 110		70-130	2	20	
4-Bromofluorobenzene (S)	~ 3 ~= %.				82		70-130	_		
Dibromofluoromethane (S)	%.				93		70-130			
Toluene-d8 (S)	%.		i i		92		70-130			;

MATRIX SPIKE & MATRIX SP	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 598528				598529							
Parameter	44 Units	059502001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD ⁻ % Rec	% Rec	RPD	Max . RPD	Qual
1,1,1-Trichloroethane	uq/L	<0.90	50	50	60.9	61.2	122	122	70-133		20	
1,1,2,2-Tetrachloroethane	ug/L	<0.20	50	50	48.7	54.2	97	108	70-130	11	20	
1,1,2-Trichloroethane	ug/L	<0.42	50	50	51.6	55.1	103	110	70-130	7	20	
1,1-Dichloroethane	ug/L	<0.75	50	50	65.0	64.9	130	130	70-133	0	20	

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QUALITY CONTROL DATA

Project: 2088 NORTH PLANT MGP

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Pace Project No.:

lo.: 4059458

MATRIX SPIKE & MATRIX SPIK	E DUPLICAT	E: 598528	8		598529							
			MS	MSD								
,	4(059502001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
1,1-Dichloroethene	ug/L •	<0.57	50	50	52,4	51.2	105	102	70-130	2	20	
1,2-Dichloroethane	ug/L	0.45J	50	50	60.4	61.0	120	121	70-145	1	20	
1,2-Dichloropropane	ug/L	<0.49	50	50	61.6	61.8	123	124	70-130	0	23	
2-Butanone (MEK)	ug/L	<4.3	50	50	47.5	54.0	95	. 108	50-150	13	,20	
2-Hexanone	ug/L	<2.0	50	50	42.8	51.7	86	103	50-150	19	20	
4-Methyl-2-pentanone (MIBK)	ug/L	<1.2	50	50	45.8	54.9	92	110	50-150	18	20	
Acetone	ug/L	<5.0	50	50	46.2	51.3	92	103	50-150	11	20	
Benzene	ug/L	<0.41	50	50	62.0	61.8	124	124	70-130	0	20	
Bromodichloromethane	ug/L	<0.56	50	50	55.9	55.8	112	112	70-130	0	20	
Bromoform	ug/L	<0.94	50	50	42.3	43.3	85	· 87	70-130	2	20	
Bromomethane	ug/L	<0.91	50	50	38.7	42.6	77	85	52-155	9	20	
Carbon disulfide	ug/Ļ [,]	<0.66	50	50	49.5	43.8	99	· 88	61-131	12	24	
Carbon tetrachioride	ug/L	<0.49	50	50	68.2	65.7	136	131	70-158	4	20	
Chlorobenzene	ug/L	<0.41	50	50	54.8	54.6	· 110	109	70-130	0	20	
Chloroethane	ug/L	< 0.97	50	50	53.9	53.1	108	106	70-130	2	20	
Chloroform	ug/L	<1.3	50	50	6D. O	58.8	120	118	70-130	2	20	
Chloromethane	ug/L	<0.24	50	50	46.9	46.8	94	94	46-130	0	20	
cis-1,2-Dichloroethene	ug/L	<0.83	50	50	57.1	57.3	114	115	70-130	0	20	
cis-1,3-Dichloropropene	ug/L	<0.20	50	50	55.1	53.8	110	108	70-130	2	20	
Dibromochloromethane	ug/L	<0.81	50	50	49.9	51.0	100	102	70-130	2	20	
Ethylbenzene	ug/L	<0.54	50	50	57.8	57.7	- 115	115	70-130	0	20	
Methyl-tert-butyl ether	ug/L	<0.61	50	50	56.2	61.1	112	122	70-130	່ 8	20	
Methylene Chloride	ug/L	<0.43	50	50	53.7	51.6	, 107	103	70-130	4	20	
Styrene	ug/L	<0.86	50	50	52.6	52.3	105	105	19-157	1	20	
Tetrachloroethene	ug/L	<0.45	50	50	50.7	50.2	101	100	70-130	1	20	
Toluene	ug/L	<0.67	50	50	56.6	56.0	113	112	70-130	1	20	
trans-1,2-Dichloroethene	ug/L	<0.89	50	50	61.4	60. 9	123	122	70-130	1	20	
trans-1,3-Dichloropropene	ug/L	<0.19	50	50	47.6	46.8	95	94	70-130	2	20	
Trichloroethene	ug/L	<0.48	50	50	55.6	55.7	111	- 111	70-130	0	20	
Vinyl chloride	ug/L	<0.18	50	50	49.2	48.1	98	. 96	62-130	2	20	
Xylene (Total)	ug/L	<2.6	150	150	168	166	112	111	70-130	1	20	
4-Bromofluorobenzene (S)	%.						81	81	70-130			
Dibromofluoromethane (S)	%.						94	93	70-130			
Toluene-d8 (S)	%.				•		91	90	70-130			

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QUALITY CONTROL DATA

Project: 2088 NG Pace Project No.: 405945	ORTH PLANT MGP 8							·			
QC Batch: OEXT	/14392	Analysis	Method:	E	PA 8015B M	odified					
QC Batch Method: EPA 3	546	Analysis	Description	n: 8	015 Solid GC	sv					
Associated Lab Samples:	4059458001, 4059458002										
METHOD BLANK: 599641		Ma	atrix: Solid							-	- ·
Associated Lab Samples:	4059458001, 4059458002					•					
		Blank	Rep	orting							
Parameter	Units	Result	(Li	imit	Analyz	ed (Qualifiers				
TPH - Diesel (C10-C28)	mg/kg		ND	1.7	05/07/12 0	09:45					
o-Terphenyl (S)	· %.		69	39-130	05/07/12 (09:45					,
											`
LABORATORY CONTROL S	AMPLE: 599642		·								
	- ,	Spike	LCS		LCS	' % Rec					
Parameter	Units	Conc.	Result		% Rec	Limits	Q	ualifiers	·		
TPH - Diesel (C10-C28)	mg/kg	16.7	1	3.3	80	53-	-130		-		
o-Terphenyl (S)	%.				92	39-	-130				
MATRIX SPIKE & MATRIX S	PIKE DUPLICATE: 5996	43	5	99644		<u>-</u>					
		MS	MSD								
	4059408001	•	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units Result	Conc.	Conc. I	Result	Result	% Rec	% Rec	Limits	RPD 1	RPD	Qual
TPH - Diesel (C10-C28)	mg/kg 2.1	18.1	1 8.1	14.9	15.4	71	74	10-190	4	50	
o-Terphenyl (S)	%.					88	88	39-130)		

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QUALITY CONTROL DATA

Project: Pace Project No.:	2088 NORTH PLANT M 4059458	GP					
QC Batch:	OEXT/14415		Analysis M	ethod:	EPA 8082		
QC Batch Method:	EPA 3510		Analysis De	escription:	8082 GCS PCB		•
Associated Lab Sar	nples: 4059458003		,				
METHOD BLANK:	601743		Matrix	c: Water			
Associated Lab San	nples: 4059458003						
			Blank	Reporting		· .	
Parar	neter	Units	Result	Limit	Analyzed	Qualifiers	

. Parameter	Units	Result	Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.50	05/09/12 02:06	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.50	05/09/12 02:06	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.50	05/09/12 02:06	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.50	05/09/12 02:06	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.50	05/09/12 02:06	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.50	05/09/12 02:06	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.50	05/09/12 02:06	
Decachlorobiphenyl (S)	%.	61	31-130	05/09/12 02:06	
Tetrachloro-m-xylene (S)	%.	87	10-173	05/09/12 02:06	•

LABORATORY CONTROL SAM	PLE & LCSD: 601744		60)1745						
· .		Spike	LCS	LCSD	LCS	LCSD	% Rec		Max	
Parameter	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qualifiers
PCB-1016 (Aroclor 1016)	 ug/L		ND	ND					29	
PCB-1221 (Aroclor 1221)	ug/L		ND	ND					29	
PCB-1232 (Aroclor 1232)	ug/L	•	ND	ND					29	
PCB-1242 (Aroclor 1242)	ug/L		ND	ND					.29	
PCB-1248 (Aroclor 1248)	ug/L		ND	ND					29	
PCB-1254 (Aroclor 1254)	ug/L		ND	ND					29	
PCB-1260 (Aroclor 1260)	ug/L	2.5	· 2.2	2.4	87	96	51-142	10	29	
Decachlorobiphenyl (S)	%.			• •	51	64	31-130			
Tetrachloro-m-xylene (S)	%.				71	66	10-173			

MATRIX SPIKE SAMPLE:	601746						
Parameter	Units	4059513001 Result	Spike Conc.	MS Result	MS % Rec	,% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	<1.5		• ND			
PCB-1221 (Aroclor 1221)	ug/L ′	<1.5		ND			
PCB-1232 (Aroclor 1232)	ug/L	<1.5		ND			
PCB-1242 (Aroclor 1242)	ug/L	<1.5		ŇĎ			
PCB-1248 (Arocior 1248)	ug/L	<1.5		ND			
PCB-1254 (Aroclor 1254)	ug/L	. <1.5		ND			
PCB-1260 (Aroclor 1260)	ug/L	<1.5	. 25	24.9	100	10-156	
Decachlorobiphenyl (S)	%.				101	31-130	
Tetrachloro-m-xylene (S)	%.	·			63	. 10-173	

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QUALITY CONTROL DATA

Project: 2088 NORTH	PLANT MGP						
Pace Project No.: 4059458		•					
QC Batch: OEXT/1436	8	Analysis Metho	od: EF	A 8270			
QC Batch Method: EPA 3510		Analysis Desci	tiption: 82	70 Water MSSV		· -	
Associated Lab Samples: 4059	458003					-	
METHOD BLANK: 598687		Matrix: V	Vater		· · · · · ·		
Associated Lab Samples: 4059	458003						
		Blank	Reporting				
Parameter	Units	Result	Limit	Analyzed	Qualifiers		
1,2,4-Trichlorobenzene	ug/L	ND	. 5.0	05/02/12 10:55			
1,2-Dichlorobenzene	ug/L	ND	5.0	05/02/12 10:55			
1,3-Dichlorobenzene	ug/L	ND	5.0	.05/02/12 10:55			
1,4-Dichlorobenzene	ug/L	ND	5.0	05/02/12 10:55			
2,2'-Oxybis(1-chloropropane)	ug/L	ND	5.0	05/02/12 10:55			
2,4,5-Trichlorophenol	ug/L	ND	5.0	05/02/12 10:55			
2,4,6-Trichlorophenol	ug/L	ND	5.0	05/02/12 10:55			
2,4-Dichlorophenoi	ug/L	ND	5.0	05/02/12 10:55			
2,4-Dimethylphenol	ug/L	ND	5.0	05/02/12 10:55			
2,4-Dinitrophenol	ug/L	ND	10.0	05/02/12 10:55			
2,4-Dinitrotoluene	ug/L	ND	5.0	05/02/12 10:55			
2,6-Dinitrotoluene	ug/L	ND	5.0	05/02/12 10:55			
		ND	5.0	05/02/12 10:55			
2-Chloronaphthalene	ug/L	ND					
2-Chlorophenol	ug/L	,	5.0	05/02/12 10:55			
2-Methylnaphthalene	ug/L	ND	5.0	05/02/12 10:55			
2-Methylphenol(o-Cresol)	ug/L	ND	5.0	05/02/12 10:55			
2-Nitroaniline	ug/L	ND	5.0	05/02/12 10:55			
2-Nitrophenol	ug/L	ND	5.0	05/02/12 10:55			
3&4-Methylphenol(m&p Cresol)	ug/L	ND	. 5.0	05/02/12 10:55	•		
3,3'-Dichlorobenzidine	ug/L	ND	5.D	05/02/12 10:55			
3-Nitroaniline	ug/L	ND	5.0	05/02/12 10:55			
4.6-Dinitro-2-methylphenol	ug/L	ND	5.0	05/02/12 10:55			
4-Bromophenylphenyl ether	ug/L	. ND	5.0	05/02/12 10:55			
4-Chloro-3-methylphenol	ug/L	ND	5.0	05/02/12 10:55			
4-Chloroaniline	ug/L	NĎ	5.0	05/02/12 10:55			
4-Chlorophenylphenyl ether	ug/L	ND	5.0	05/02/12 10:55			
4-Nitroaniline	ug/L	, ND	5.0	05/02/12 10:55			
4-Nitrophenol	ug/L	ND	10.0	05/02/12 10:55			
Acenaphthene	ug/L	ND	5.0	05/02/12 10:55			
•	-	ND	5.0	05/02/12 10:55			
Acenaphthylene	ug/L	1 I I I I I I I I I I I I I I I I I I I				•	
Anthracene	ug/L	ND	5.0	05/02/12 10:55			
Benzo(a)anthracene	ug/L	ND	5.0	05/02/12 10:55			
Benzo(a)pyrene	ug/L	ND	5.0	05/02/12 10:55			
Benzo(b)fluoranthene	ug/L	ND	5.0	05/02/12 10:55			
Benzo(g,h,i)perylene	ug/L	ND	5.0	05/02/12 10:55			
Benzo(k)fluoranthene	ug/L	ND	5.0	05/02/12 10:55			
bis(2-Chloroethoxy)methane	ug/L	ND	5.0	05/02/12 10:55			
bis(2-Chloroethyl) ether	ug/L	ND	5.0	05/02/12 10:55			
bis(2-Ethylhexyl)phthalate	ug/L	ND	5.0	05/02/12 10:55			
Butylbenzylphthalate	ug/L	ND	5.0	05/02/12 10:55			
Carbazole	ug/L	ND	5.0	05/02/12 10:55			
	-						
Chrysene	ug/L	ND	5.0	05/02/12 10:55			

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QUALITY CONTROL DATA

Project:2088 NORTH PLANT MGPPace Project No.:4059458

METHOD BLANK: 598687

Matrix: Water

Associated Lab Samples: 4059458003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Di-n-octylphthalate	ug/L		5.0	05/02/12 10:55	
Dibenz(a,h)anthracene	ug/L	ND	5.0	05/02/12 10:55	
Dibenzofuran	ug/L	ND	5.0	05/02/12 10:55	
Diethylphthalate	ug/L	ND	5.0	05/02/12 10:55	
Dimethylphthalate	ug/L	ND	5.0	05/02/12 10:55	
Fluoranthene	ug/L	ND	5.0	05/02/12 10:55	
Fluorene	ug/L	· ND	5.0	05/02/12 10:55	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	05/02/12 10:55	
Hexachlorobenzene	ug/L	. ND	5.0	05/02/12 10:55	
Hexachlorocyclopentadiene	ug/L	ND	5.0	05/02/12 10:55	
Hexachloroethane	ug/L	ND	5.0	05/02/12 10:55	•
Indeno(1,2,3-cd)pyrene	ug/L	ND	5.0	05/02/12 10:55	
Isophorone	ug/L	ND	5.0	05/02/12 10:55	
N-Nitroso-di-n-propylamine	ug/L	ND	5.0	05/02/12 10:55	
N-Nitrosodiphenylamine	ug/L	ND	10.0	05/02/12 10:55	
Naphthalene	ug/L	ND	5.0	05/02/12 10:55	
Nitrobenzene	ug/L	ND	5.0	05/02/12 10:55	
Pentachlorophenol	ug/L	ND	10.0	05/02/12 10:55	
Phenanthrene	ug/L	ND	5.0	05/02/12 10:55	
Phenol	ug/L	ND	5.0	05/02/12 10:55	
Pyrene	ug/L	ND	5.0	05/02/12 10:55	
2,4,6-Tribromophenol (S)	%.	· 72	38-130	05/02/12 10:55	
2-Fluorobiphenyl (S)	%.	. 77	51-130	05/02/12 10:55	
2-Fluorophenol (S)	%.	42	24-130	05/02/12 10:55	
Nitrobenzene-d5 (S)	%.	69	41-130	05/02/12 10:55	
Phenol-d6 (S)	%.	27	13-130	05/02/12 10:55	
Terphenyl-d14 (S)	%.	70	38-130	05/02/12 10:55	

LABORATORY CONTROL SAMPLE: 598688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limi ts	Qualifiers
						Quanters
1,2,4-Trichlorobenzene	ug/L	. 50	40.0	80	53-130	
1,2-Dichlorobenzene	ug/L	50	40.4	81	41-130	
1,3-Dichlorobenzene	ug/L	50	39.2	78	35-130	
1,4-Dichlorobenzene	ug/L	50	39.5	79	36-130	
2,2'-Oxybis(1-chloropropane)	ug/L	50	41.5	83	54-130	
2,4,5-Trichlorophenol	ug/L	50	43.8	88	65-130	
2,4,6-Trichlorophenol	ug/L	50	43.7	87	60-130	
2,4-Dichlorophenol	ug/L	50	40.4	81	63-130	
2.4-Dimethylphenol	ug/L	50	26.3	53	17-130	
2,4-Dinitrophenol	ug/L	50	39.6	79	23-130	
2,4-Dinitrotoluene	ug/L	50	45.2	90	58-131	
2,6-Dinitrotoluene	ug/L	50	44.8	90	65-130	
2-Chloronaphthalene	ug/L	50	43.0	86	64-130	
2-Chlorophenol	ug/L	50	35.2	70	49-130	

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QUALITY CONTROL DATA

Project: 2088 NORTH PLANT MGP Pace Project No.: 4059458

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LABORATORY CONTROL SAMPLE: 598688 LCS LCS % Rec Spike Parameter Units Conc, Result % Rec Limits Qualifiers 2-Methylnaphthalene ug/L 50 43.7 87 66-130 30.9 62 2-Methylphenol(o-Cresol) ug/L 50 36-130 100 66-130 50 50.1 2-Nitroaniline ug/L 2-Nitrophenol 50 42.2 84 48-130 ug/L 50 27.9 56 3&4-Methylphenol(m&p Cresol) 34-130 ug/L 3,3'-Dichlorobenzidine ug/L 50 44.9 90 43-130 3-Nitroaniline ug/L 50 48.2 96 53-130 4,6-Dinitro-2-methylphenol ug/L 50 37.0 74 41-133 4-Bromophenylphenyl ether ug/L 50 44.4 89 70-130 4-Chloro-3-methylphenol 50 37.9 76 42-130 ug/L 88 48-130 4-Chloroaniline ug/L 50 44.1 87 67-130 4-Chlorophenylphenyl ether ug/L 50 43.4 52.6 105 46-130 4-Nitroaniline ug/L 50 ug/L 22.2 44 14-130 4-Nitrophenol 50 Acenaphthene ug/L 50 43.1 86 70-130 ug/L 86 Acenaphthylene 50 42.9 70-130 50 **4**4.2 88 70-130 Anthracene ug/L Benzo(a)anthracene 50 44.6 89 70-130 ug/L 75 50 Benzo(a)pyrene ug/L 37.6 65-130 72 50 35.8 56-130 Benzo(b)fluoranthene ug/L 50 46.5 93 Benzo(g,h,i)perylene ug/L 49-136 Benzo(k)fluoranthene ug/L 50 46.6 93 62-130 89 bis(2-Chloroethoxy)methane 50 44.7 66-130 ug/L. 42.8 86 58-130 bis(2-Chloroethyl) ether ug/L 50 bis(2-Ethylhexyl)phthalate 50 45.4 91 58-138 uq/L Butylbenzylphthalate ug/L 50 44.4 89 44-152 95 Carbazole ug/L 50 47.5 68-130 88 70-130 50 Chrysene ug/L 44.2 Di-n-butylphthalate 50 43.3 87 66-130 ug/L 99 Di-n-octylphthalate. \ 50 49.5 64-134 ug/L 50 48.4 97 50-131 Dibenz(a,h)anthracene ug/L Dibenzofuran 50 45.2 90 67-130 ug/L 42.2 Diethylphthalate ug/L 50 84 61-130 50 42.5 85 61-130 Dimethylphthalate ug/L Fluoranthene 50 46.2 92 59-130 ug/L Fluorene ug/L 50 45.4 91 70-130 78 Hexachloro-1,3-butadiene ug/L 50 38.9 40-130 80 Hexachlorobenzene ug/L 50 39.8 67-130 21.1 42 50 Hexachlorocyclopentadiene 10-130 ug/L 50 36.9 74 28-130 Hexachloroethane ug/L 85 indeno(1,2,3-cd)pyrene ug/L 50 42.4 41-132 50 39.3 79 40-130 Isophorone ug/L N-Nitroso-di-n-propylamine 50 43.4 87 57-130 ug/L 50 108 N-Nitrosodiphenylamine ug/L 53.9 59-144 50 43.8 88 64-130 Naphthalene ug/L 50 41.8 84 59-130 Nitrobenzene. ug/L Pentachlorophenol 50 37.6 75 45-130 ug/L Phenanthrene ug/L 50 44.3 89 70-130

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QUALITY CONTROL DATA

Project: 2088 NORTH PLANT MGP Pace Project No .: 4059458

LABORATORY CONTROL SAMPLE: 598688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec	Qualifiers
Phenol	ug/L	50	22.2	44	26-130	
Pyrene	ug/L	50	43.9	88	51-130	
2,4,6-Tribromophenol (S)	%.			81	38-130	
2-Fluorobiphenyl (S)	%.			84	51-130	
2-Fluorophenol (S)	%.	•		50	24-130	
Nitrobenzene-d5 (S)	%.			87	41-130	
Phenol-d6 (S)	%.	1.		38	13-130	
Terphenyl-d14 (S)	%.			75	38-130	

MATRIX SPIKE & MATRIX SPI	IKE DUPLICATE: 598689			598690								
	• 4	059463007	MS Spike	MSD Spike	MS	MSD.	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
1,2,4-Trichlorobenzene	 ug/L	<0.84	47.6	47.6	38.2	38.2	80	80	45-130	· 0	22	
1,2-Dichlorobenzene	ug/L	<0.68	47.6	47.6	39.1	39.1	82	82	· 39-130	0	34	
1,3-Dichlorobenzene	ug/L	<0.79	47.6	47.6	38.3	38.1	80	80	34-130	1	40	
1,4-Dichlorobenzene	ug/L	<0.83	47.6	47.6	39.0	37.8	82	79	33-130	3	38	
2,2'-Oxybis(1-chloropropane)	ug/L	<0.79	47.6	47.6	39.6	39.7	83	83	44-130	0	20	
2,4,5-Trichlorophenol	ug/L	< 0.96	47.6	47.6	45.2	43.6	95	92	65-130	3	20	
2,4,6-Trichlorophenol	ug/L	<1.0	47.6	47.6	44.1	43.7	93	92	60-130	1	20	
2,4-Dichlorophenol	ug/L	<1.1	47.6	47.6	44.5	43.5	94	91	57-130	2	20	
2,4-Dimethylphenol	ug/L	<1.1	47.6	47.6	34.6	32.7	73	69	10-145	6	27	
2,4-Dinitrophenol	ug/L	<2.0	47.6	47.6	46.8	46.1	98	97	10-153	2	33	
2.4-Dinitrotoluene	ug/L	· <0.77	47.6	47.6	44.8	44.5	94	93	35-139	1	20	
6-Dinitrotoluene	ug/L	<1.0	47.6	47.6	42. 9	43.4	90	91	40-138	1	20	
- Chloronaphthalene	ug/L	<0.81	47.6	47.6	39.9	41.5	84	87	64-130	4	20	
-Chlorophenol	ug/L	<0.67	47.6	47.6	40.4	39.8	85	84	49-130	1	20	
2-Methylnaphthalene	ug/L	<1.3	47.6	47.6	41.3	41.4	87	87	42-136	0	20	
-Methylphenol(o-Cresol)	ug/L	<0.94	47.6	47.6	36.8	36.1	77	76	28-130			
2-Nitroaniline	ug/L	<0.80	47.6	47.6	48.3	49.2	101	103	46-132	2	20	
2-Nitrophenol	ug/L	<1.3	47.6	47.6	43.0	42.6	90	- 89	48-130	1	20	
3&4-Methylphenol(m&p	í ug/L	<0.74	47.6	47.6	32.6	32.2	69	68	34-130			
Cresol)												
3,3'-Dichlorobenzidine	ug/L	<1.1	47.6	47.6	45.3	40.5	95	85	10-136	11	28	
3-Nitroaniline	ug/L	<0.93	47.6	47.6	· 49.3	47.7	103	100	20-132	3		
l,6-Dinitro-2-methylphenol [,]	ug/L	<0.72	47.6	47.6	38.4	38.3	81	80	29-145	0		
-Bromophenylphenyl ether	ug/L	<1.3	47.6	47.6	43.2	41.4	91	87	66-130	4	20	
I-Chloro-3-methylphenol	ug/L	<0.97	47.6	47.6	44.3	42.9	93	90	42-130	3		
-Chloroaniline	ug/L	<0.78	47.6	47.6	48.2	43.3	101	91	10-130	11	29	
-Chlorophenylphenyl ether	ug/L	<1.1	47.6	47.6	42.2	41.1	89	86	63-130	2	20	
l-Nitroaniline	ug/L	<1.1	47.6	47.6	55.5	. 51.7	117	.109	10-154	7	21	
-Nitrophenol	ug/L	<0.84	47.6	47.6	22.0	22.1	46	46	1 0-1 30	0		
Acenaphthene .	ug/L	<0.92	47.6	47.6	41.0	41.6	86	87	58-130	2		
Acenaphthylene	ug/L	<0.96	47.6	47.6	40.9	41.1	86	86	62-130	1	_	
Anthracene	ug/L	<0.60	47.6	47.6	43.7	43.3	92	91	62-130	1	20	
Benzo(a)anthracene	ug/L	<0.59	47.6	47.6	43.2	41.1	91	86	64-130	5		
Benzo(a)pyrene	ug/L	<0.93	47.6	47.6	37.7	36.9	79	78	46-130	· 2	20	

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QUALITY CONTROL DATA

Project: 2088 NORTH PLANT MGP Pa

MATRIX SPIKE & MATRIX SPII	KE DUPLICATI	E: 59868	9		598690						
			MS	MSD							
(40	59463007	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD
Benzo(b)fluoranthene	ug/L	<1.4	47.6	47.6	38.8	39.3	81	83	51-130	1	20
Benzo(ġ,h,i)perylene	ug/L	<0.74	47.6	47.6	45.3	44.0	95	92	47-136	3	36
Benzo(k)fluoranthene	ug/L	<0.99	47.6	. 47.6	40.4	39.8	85	83	45-140	1	23
bis(2-Chloroethoxy)methane	ug/L	<1.1	47.6	47.6	42.6	42.2	89	89	64-130	1	20
bis(2-Chloroethyi) ether	ug/L	<0.63	47.6	47.6	40.7	42.6	85	89	57-130	5	20
bis(2-Ethylhexyl)phthalate	ug/L	<2.5	47.6	47.6	44.9	42.7	94	90	28-173	5	20
Butylbenzylphthalate	ug/L	<1.0	47.6	47.6	42.5	41.0	89	86	32-152	- 4	20
Carbazole	ug/L	<0.67	47.6	47.6	46.8	45.8	98	96	5 6-1 30	2	20
Chrysene	ug/L	<0.75	47.6	47.6	42.5	41.2	89	<u></u> 87	65- 1 30	3	20
Di-n-butylphthalate	ug/L	<0.86	47.6	47.6	42.9	41.9	90	88	51 -1 41	2	20
Di-n-octylphthalate	ug/L	<1.5	47.6	47.6	49.0	46.7	103	98	29-176	5	20
Dibenz(a,h)anthracene	ug/L	<1.3	47.6	47.6	46.9	43.9	99	92	44-131	7	33
Dibenzofuran	ug/L	<1.0	47.6	47.6	43.0	43.4	90	91	57-136	1	20
Diethylphthalate	ug/L	<1.3	47.6	47.6	40.9	41.0	86	86	61-130	0	20
Dimethylphthalate	ug/L	<1.0	47.6	47.6	42.2	41.2	89	87	61-130	- 2	20
Fluoranthene	ug/L	<0.88	47.6	47.6	46.9	45.8	99	96	55-130	3	20
Fluorene	ug/L	<1.1	47.6	47.6	44.4	44.3	93	93	51-131	0	· 20
Hexachloro-1,3-butadiene	ug/L	< 0.63	47:6	47.6	37.6	35.4	79	74	29-130	6	- 38
Hexachlorobenzene	ug/L	<1.1	47.6	47.6	38.2	37.9	80	80	46-152	1	20
Hexachlorocyclopentadiene	ug/L	<1.1	47.6	47.6	27.3	25.6	57	54	10-130	6	50
Hexachloroethane	ug/L	<0.56	47.6	47.6	37.6	36.6	79	7,7	24-130	3	4
Indeno(1,2,3-cd)pyrene	ug/L	<0.64	47.6	47.6	41.4	40.8	87	86	41-132	· 1	- 36
Isophorone	ug/L	<1.3	47.6	47.6	38.1	36.9	80	77	40-130	3	2
N-Nitroso-di-n-propylamine	ug/L	<1.0	47.6	47.6	42.8	43.4	90	91	57-134	1	20
N-Nitrosodiphenylamine	ug/L	<2.4	47.6	47.6	47.1	45.8	99	96	50-145	3	4
Naphthalene	ug/L	<0.68	47.6	47.6	42.1	41.1	88	86	55-130		
Nitrobenzene	ug/L	<1.3	47.6	47.6	39.6	39.2	83	82	59-1 30		
Pentachlorophenol	ug/L	<1.0	47.6	47.6	40.8	39.2	85	82	10-164		
Dt	- 3				10.1						

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Phenanthrene

2,4,6-Tribromophenol (S)

2-Fluorobiphenyl (S)

2-Fluorophenol (S)

Terphenyl-d14 (S)

Phenol-d6 (S)

Nitrobenzene-d5 (S)

Phenol

Pyrene

ug/Ŀ

ug/L

ug/L

%.

%.

%.

%.

%.

%.

< 0.61

<0.99

<1.5

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47.6

47.6

47.6

43.4

21.3

42.1

42.4

21.3

40.3

91

45

88

87

77

51

83

36

76

89

45

85

87

82

54

83

37

72

63-**1**30

22-130

51-130

38-130

51-130

24-130

41-130

13-130

38-130

47.6

47.6

47.6

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QUALITY CONTROL DATA

Project: 2088 NOR	TH PLANT MGP			
Pace Project No.: 4059458			•	•
QC Batch: PMST/70	19 Analysis Method:	ASTM D2974-87		
QC Batch Method: ASTM D2	2974-87 Analysis Description:	Dry Weight/Percent Moisture		
Associated Lab Samples: 40	59458001, 4059458002			

SAMPLE DUPLICATE: 603244

Parameter	Units	4059760008 Result	Dup Result	RPD	Max RPD	Qualifiers	
Percent Moisture	%	12.7	12.5	2	10		

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QUALITY CONTROL DATA

				·	·			·			
2C Batch: WETA/1			•			PA 351.2					
C Batch Method: EPA 351			Analys	iis Descripti	ion: 3:	51.2 TKN Di	ssolved				
Associated Lab Samples: 40)59458003										
METHOD BLANK: 601763			N	Matrix: Wat	er	•					
Associated Lab Samples: 40	59458003		•	-					•		
Parameter		Units	Blank Resul		eporting Limit	Analyz	ed	Qualifiers			
Vitrogen, Kjeldahl, Total, Disso	lved mg/L			ND	1.0	·			_		
nitogen, njeluani, total, Disso	ived nig/L	· .		U	1.0	05/01/12	14.30			•	
ABORATORY CONTROL SA	MPLE: 60176	64	Spike	LCS		LCS	% Rec				
Parameter		Units	Conc.	Resu		% Rec	Limits		alifiers		
Nitrogen, Kjeldahl, Total, Disso	lved mg/L		5	, <u> </u>	5.1	101	90	-110			
MATRIX SPIKE & MATRIX SP		E: 60176			601766						
			MS	MSD			-				
		059533004	Spike	Spike	MS	MSD	MS	MSD	% Rec	Max	_
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD RPD	Qua
Nitrogen, Kjeldahl, Total, Dissolved	mg/L	<0.35	5	5	5.0	4.6	99	91	.90-110	9	
			_								•
			-								
· · ·											
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QUALITY CONTROL DATA

Project: Pace Project No.:	2088 NOF 4059458	RTH PLANT MO	3P					-					
QC Batch:	WETA/1	2273		Analys	is Method:	E	PA 365.4						
QC Batch Method:	EPA 365	.4		Analys	is Descript	ion: 3	65.4 Phosph	norus					
Associated Lab San	nples: 40	059458003										•	
METHOD BLANK:	602395			4	Aatrix: Wat	er					·		
Associated Lab Sam	nples: 40	059458003											
				Blank	K Re	eporting							
Рагал	neter		Units	Resul	t	Limit	Analyz	ed	Qualifiers				
Phosphorus		mg/L			ND	0.40	05/09/12	14:04					
LABORATORY CON	TROL SA	MPLE: 60239	96				•						· ·
Param	neter		Units	Spike Conc.	LCS Resu		LCS % Rec	% Rec		ualifiers			
Phosphorus		mg/L		5		5.1	103	90	-110		-		
MATRIX SPIKE & M			E: 60239	7		602398	·			· · ·		<u>-</u> ,	
				MS	MSD			,					
		40	59809006	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramet	er	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Phosphorus		mg/L	8.8	20	20	28.4	29.6	98	104	90-110	4	20	
MATRIX SPIKE & M	ATRIX SPI	KE DUPLICAT	E: 60239	9		602400							
			•	MS	MSD .								
D			59647002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	· • • •
Paramet	er 	Units	Result	Conc.	Сопс.	Result	Result	% Rec	% Rec	Limits			Qual
Phosphorus		mg/L	<0.20	5	5	5.3	5.3	103	102	90-110	1	20	

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QUALIFIERS

Project: 2088 NORTH PLANT MGP Pace Project No.: 4059458

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: GCV/8314

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: GCSV/7578

[1] The default spike range of the standard used for QC evaluation is C10-C28. All other carbon ranges may recover outside of spike limits because they may not cover the range of the spike used.

Batch: GCSV/7594

[1] The continuing calibration is outside of method acceptance limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias. Any samples with the presence of analytes above reporting limits were reanalyzed in a valid window.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

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Applution

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:	2088 NORTH PLANT MGP	÷
Pace Project No .:	4059458	

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4059458001	042312001	EPA 3546	OEXT/14392	EPA 8015B Modified	GCSV/7578
4059458002	042312002	EPA 3546	OEXT/14392	EPA 8015B Modified	GCSV/7578
4059458003	042512001	EPA 3510	OEXT/14415	EPA 8082	GCSV/7594
4059458001	042312001	EPA 5035A/5030B	GCV/8311	EPA 8015B Modified	GCV/8314
4059458002	042312002	EPA 5035A/5030B	GCV/8311	EPA 8015B Modified	GCV/8314
4059458003	042512001	EPA 6010	ICP/5882		
4059458003	042512001	EPA 7470	MERP/3057	EPA 7470	MERC/3471
4059458003	042512001	EPA 3510	OEXT/14368	EPA 8270	MSSV/4556
4059458003	042512001	EPA 8260	MSV/15014		
4059458004	TRIP042512	EPA 8260	MSV/15014		
4059458001	042312001	ASTM D2974-87	PMST/7019		
4059458002	042312002	ASTM D2974-87	PMST/7019		
4059458003	042512001	EPA 351.2	WETA/12235	EPA 351.2	WETA/12251
4059458003	042512001	EPA 365.4	WETA/12273	EPA 365.4	WETA/12278

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July 11, 2012

Glenn Luke Natural Resource Technologies 23713 W Park Rd Pewaukee, WI 53072

RE: Project: 2088 NORTH PLANT MGP Pace Project No.: 4062415

Dear Glenn Luke:

Enclosed are the analytical results for sample(s) received by the laboratory on June 26, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian Basten

brian.basten@pacelabs.com Project Manager

Endosures

cc: Brian Hennings, NATURAL RESOURCE TECHNOLOGY



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CERTIFICATIONS

Project: Pace Project No.:	2088 NORTH PLANT MGP 4062415		
Florida/NELAP Ce Illinois Certificatior Kentucky Certifica Louisiana Certifica	eet, Green Bay, WI 54302 rtification #: E87948 n #: 200050 tion #: 82	New York Certification #: 11888 North Carolina Certification #: 503 North Dakola Certification #: R-150 South Carolina Certification #: 83006001 US Dept of Agriculture #: S-76505 Wisconsin Certification #: 405132750	

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SAMPLE SUMMARY

Project: Pace Project No	2088 NORTH PLANT MGP 5.: 4062415		•••••••••••••••••••••••••••••••••••••••	
Lab ID	Sample ID	Matrix	Date Collected	Date Received
4062415001	062012001	Solid	06/20/12 11:18	06/26/12 08:50
4062415002	062012002	Solid	06/20/12 13:50	06/26/12 08:50
4062415003	062112003	Solid	06/21/12 09:05	06/26/12 08:50
4062415004	062112004	Solid	06/21/12 12:00	06/26/12 08:50
4062415005	062112005	Solid	06/21/12 14:15	06/26/12 08:50
4062415006	062212006	Solid	06/22/12 12:00	06/26/12 08:50
4062415007	062212007	Solid	06/22/12 15:05	06/26/12 08:50

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SAMPLE ANALYTE COUNT

.ab iD	Sample ID	Method	Analysts	Analytes Reported	
062415001	062012001	EPA 8015B Modified	НМН	2	
		EPA 8015B Modified	LCM	1	
	r	ASTM D2974-87	SKW	、 1	
062415002	062012002	EPA 8015B Modified	нмн	2	
		EPA 8015B Modified	LCM	1	
		ASTM D2974-87	SKW	1	
062415003	062112003	EPA 8015B Modified	НМН	2	
		EPA 8015B Modified	LCM	1	
		ASTM D2974-87	SKW	1	
062415004	062112004	EPA 8015B Modified	НМН	2	
<i>(</i>		EPA 8015B Modified	LCM	1	
,		ASTM D2974-87	SKW	1	
062415005	062112005	EPA 8015B Modified	НМН	2	
		EPA 8015B Modified	LCM	· 1	
	•	ASTM D2974-87	SKW	1	
062415006	062212006	EPA 8015B Modified	НМН	2	
		EPA 8015B Modified	LCM	1.	
		ASTM D2974-87	SKW	1	
062415007	062212007	EPA 8015B Modified	НМН	2	
		EPA 8015B Modified	LCM	1	
		ASTM D2974-87	SKW	. 1	

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PROJECT NARRATIVE

Project: 2088 NORTH PLANT MGP Pace Project No.: 4062415	
Method:EPA 8015B ModifiedDescription:8015 GCS THC-DieselClient:Natural Resources TechnologiesDate:July 11, 2012	
General Information: 7 samples were analyzed for EPA 8015B Modified. All samples were received in	acceptable condition with any exceptions noted below.
Hold Time: The samples were analyzed within the method required hold times with any except	ptions noted below.
Sample Preparation: The samples were prepared in accordance with EPA 3546 with any exceptions no	ted below.
Initial Calibrations (including MS Tune as applicable): All criteria were within method requirements with any exceptions noted below.	
Continuing Calibration: All criteria were within method requirements with any exceptions noted below.	
Surrogates: All surrogates were within QC limits with any exceptions noted below.	
QC Batch: OEXT/14988	
 S4: Surrogate recovery not evaluated against control limits due to sample 062012001 (Lab ID: 4062415001) o-Terphenyl (S) 062012002 (Lab ID: 4062415002) o-Terphenyl (S) 062112003 (Lab ID: 4062415003) 	e dilution.
 o-Terphenyl (S) 062112004 (Lab ID: 4062415004) o-Terphenyl (S) 062112005 (Lab ID: 4062415005) o-Terphenyl (S) 	
 • 062212006 (Lab ID: 4062415006) • o-Terphenyl (S) • 062212007 (Lab ID: 4062415007) • o-Terphenyl (S) • MS (Lab ID: 627260) 	
• o-Terphenyl (S) • o-Terphenyl (S) • o-Terphenyl (S)	

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project:	2088 NORTH PLANT MGP
Pace Project No .:	4062415

Method:EPA 8015B ModifiedDescription:8015 GCS THC-DieselClient:Natural Resources TechnologiesDate:July 11, 2012

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: OEXT/14988

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 4061964005

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

• MSD (Lab ID: 627261)

• TPH - Diesel (C10-C28)

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Batch Comments:

The default spike range of the standard used for QC evaluation is C10-C28. All other carbon ranges may recover outside of spike limits because they may not cover the range of the spike used. • QC Batch: GCSV / 7879

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PROJECT NARRATIVE

Project:	2088 NORTH PLANT MGF
Pace Project No.:	4062415

Method: EPA 8015B Modified Description: Gasoline Range Organics

Client: Natural Resources Technologies Date: July 11, 2012

General Information:

7 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: GCV/8585

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

• 062012002 (Lab ID: 4062415002)

TPH (C06-C10)

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4062415

Sample: 062012001	Lab ID: 406241	5001	Collected: 06/20/	12 11:18	Received: 06	6/26/12 08:50	Matrix: Solid		
Results reported on a "dry-weig Parameters	-	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
Falanteels						Analyzeu			
8015 GCS THC-Diesel	Analytical Method:	EPA 801	5B Modified Prepa	aration M	lethod: EPA 3546	S .			
TPH - Diesel (C10-C28)	125 mg/kg		4.0	2	06/27/12 06:55	06/27/12 13:44	ł		
Surrogates o-Terphenyl (S)	0 %.		39-130	· 2	06/27/12 06:55	06/27/12 13:44	4 84-15-1	S4	
Gasoline Range Organics	Analytical Method;	Analytical Method: EPA 8015B Modified Preparation Method: EPA 5035A/5030B							
TPH (C06-C10)	ND mg/kg		11.9	1	06/28/12 07:50	06/28/12 15:14	F		
Percent Moisture	Analytical Method:	ASTM D	2974-87	•					
Percent Moisture	16.3 %		0.10	1		07/10/12 13:10)		
Sample: 062012002	Lab ID: 406241	5002	Collected: 06/20/	12 13:50	Received: 06	6/26/12 08:50	Matrix: Solid		
Results reported on a "dry-weig									
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8015 GCS THC-Diesel	Analytical Method:	EPA 801	5B Modified Prepa	aration N	lethod: EPA 354	5			
TPH - Diesel (C10-C28)	, 6600 mg/kg		259	20	06/27/12 06:55	06/27/12 13:56	5		
Surrogates o-Terphenyl (S)	0 %.		39-130	20	06/27/12 06:55	06/27/12 13:56	84-15-1	S4	
Gasoline Range Organics	Analytical Method:	EPA 801	5B Modified Prepa	aration M	lethod: EPA 503	5A/5030B			
TPH (C06-C10)	ND mg/kg		103	8	06/28/12 07:50	06/28/12 14:48	3	D3	
Percent Moisture	Analytical Method:	ASTM D	2974-87						
Percent Moisture	22.6 %		0.10	1		07/10/12 13:10)	-	
Sample: 062112003	Lab ID: 406241	5003	Collected: 06/21/	12 09:05	Received: 06	6/26/12 08:50	Matrix: Solid		
Results reported on a "dry-weig	-	÷							
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8015 GCS THC-Diesel	Analytical Method:	EPA 801	5B Modified Prepa	aration N	lethod: EPA 3540	6			
TPH - Diesel (C10-C28)	1070 mg/kg		39.8	20	06/27/12 06:55	06/27/12 14:08	3 ·		
Surrogates o-Terphenyl (S)	0 %.		39-130	20	06/27/12 06:55	06/27/12 14:08	8 84-15-1	S4	
Gasoline Range Organics	Analytical Method:	EPA 801	5B Modified Prepa	aration N	lethod: EPA 503	5A/5030B			
ТРН (C06-C10)	13.2 mg/kg	•	11.9	1	06/28/12 07:50	06/28/12 15:39	Ð		
Percent Moisture	Analytical Method:	ASTM D	2974-87						
Percent Moisture	16.1 %		0.10	1		07/10/12 13:10			

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ANALYTICAL RESULTS

Sample: 062112004	Lab ID: 400	62415004	Collected: 06/21/1	2 12:00	Received: 06	/26/12 08:50 N	latrix: Solid	
Results reported on a "dry-weig	ht" basis							
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Met	thod: EPA 80	15B Modified Prepa	ration N	lethod: EPA 3546			
TPH - Diesel (C10-C28) Surrogates	1460 m	ıg/kg	46.1	4.	06/27/12 06:55	06/27/ 1 2 14:20		
o-Terphenyl (S)	0 %		39-130	4	06/27/12 06:55	06/27/12 14:20	84-15- 1	S4
Gasoline Range Organics	Analytical Me	thod: EPA 80	15B Modified Prepa	ration N	lethod: EPA 5035	A/5030B		
TPH (C06-C10)	ND m	ig/kg	11.5	1	06/28/12 07:50	06/28/12 19:05		
Percent Moisture	Analytical Me	thod: ASTM	D2974-87		•			
Percent Moisture	13.1 %	6	0.10	1		07/10/12 13:10		
					``````````````````````````````````````			
Sample: 062112005	Lab ID: 400	62415005	Collected: 06/21/1	2 14:15	Received: 06	/26/12 08:50 N	latrix: Solid	
Results reported on a "dry-weig		l la ta	Decent limit	DE	Deenser	Annahumani		0
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed .	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Me	thod: EPA 80	15B Modified Prepa	ration N	lethod: EPA 3546	ì		
TPH - Diesel (C10-C28)	861 m	ng/kg	40.4	20	06/27/12 06:55	06/27/12 14:32		
Surrogates o-Terphenyl (S)	0 %	6.	39-130	20	06/27/12 06:55	06/27/12 14:32	84-15-1	S4
Gasoline Range Organics	Analytical Me	thod: EPA 80	015B Modified Prepa	ration M	lethod: EPA 5035	A/5030B		
ТРН (С06-С10)	ND n	1 <b>g/kg</b>	12.1	1	06/28/12 07:50	06/28/12 13:56		
Percent Moisture	Analytical Me	thod: ASTM	D2974-87					
Percent Moisture	17.2 %	6	0.10	1		07/10/12 13:10		
Sample: 062212006	Lab ID: 40	62415006	Collected: 06/22/	12 12:00	Received: 06	V26/12 08:50 N	latrix: Solid	
Results reported on a "dry-weig	ht" basis							
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
8015 GCS THC-Diesel	Analytical Me	thod: EPA 8	015B Modified Prepa	ration M	lethod: EPA 3546	5		
TPH - Diesel (C10-C28)	<b>144</b> n	ng/kg	4.0	2	06/27/12 06:55	06/27/12 14:44	, ···	
Surrogates o-Terphenyl (S)	0%	6.	39-130	2	06/27/12 06:55	06/27/12 14:44	84-15-1	S4
Gasoline Range Organics	Analytical Me	thod: EPA 80	015B Modified Prepa	ration M	lethod: EPA 5035	A/5030B		
ТРН (С06-С10)	ND n	ng/kg	11.8	1	06/28/12 07:50	06/28/12 18:13		
Percent Moisture	Analytical Me	thod: ASTM	D2974-87					
Percent Moisture	15.6 %		0.10	1 ·		07/10/12 13:10	•	

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## **REPORT OF LABORATORY ANALYSIS**

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# ANALYTICAL RESULTS

Project: 2088 NO Pace Project No.: 4062415	RTH PLANT MGP	•			,		
Sample: 062212007	Lab ID: 4062415007	Collected: 06/22/1	2 15:05	Received: 06	5/26/12 08:50 N	Matrix: Solid	
Results reported on a "dry-w	eight" basis	•					
Parameters	Results Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Method: EPA	8015B Modified Prepa	ration M	lethod: EPA 3546	3		
TPH - Diesel (C10-C28) Surrogates	444 mg/kg	20.1	10	06/27/12 06:55	06/27/12 14:57		
o-Terphenyl (S)	0 %.	39-130	10	06/27/12 06:55	06/27/12 14:57	84-15-1	S4
Gasoline Range Organics	Analytical Method: EPA	8015B Modified Prepa	ration M	ethod: EPA 5035	5A/5030B		
TPH (C06-C10)	ND mg/kg	12.1	1	06/28/12 07:50	06/28/12 14:22	•	
Percent Moisture	Analytical Method: ASTI	M D2974-87		,			
Percent Moisture	17.0 %	0.10	1	`	07/10/12 15:56		

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## QUALITY CONTROL DATA

Project:	2088 NOR	TH PLANT MG	P											
Pace Project No.:	4062415													
QC Batch:	GCV/858	5		Analys	is Method:	EF	A 8015E	B Modified	1					
QC Batch Method:	EPA 5035	5A/5030B		Analys	is Descripti	ion: Ga	asoline F	ange Org	ganics					
Associated Lab Sar	nples: 40	6 <b>2415001, 40</b> 6	2415002, 4	062415003	, 40624150	04, 406241	5005, 4	06241500	<b>)6, 40624</b> 1	5007			-	
METHOD BLANK:	627983			1	Aatrix: Solio	d								
Associated Lab Sar	nples: 40	62415001, 406	2415002,4	062415003	, 40624150	04, 406241	5005, 40	06241500	06, 406241	5007				
		-		Blank	: Re	eporting								
Parar	neter	I	Units	Resul	t	Limit	Ana	lyzed	Qualif	iers				•
TPH (C06-C10)		mg/kg			ND	10.0	06/28/	12 08:48						
			•					-	·					
LABORATORY CO	NTROL SAM	IPLE & LCSD:	627984		6.	27985								
				Spike	LCS	LCSD	LCS	LCSD	% Rec			Max '		
Parar	neter	(	Units	Conc.	Result	Result	% Rec	% Rec	Limits	RP	D	RPD	Qua	alifiers
TPH (C06-C10)		mg/kg		50	44.7	44.0	89	88	79-120		1	20		
·														
MATRIX SPIKE & M	ATRIX SPI	KE DUPLICATE	E: 62798	6		627987								
				MS	MSD					_				
Parame	ter	40 Units	62457001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Re			% Rec Limits		Max RPD	Qual
TPH (C06-C10)		mg/kg	<6.3	78.8	78.8	65.2	63	6	83		67-12	0 2	20	

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# QUALITY CONTROL DATA

TPH - Diesel (C10-C o-Terphenyl (S)	28)	mg/kg %.	89.8	18	18	· 91.8	86.2	11 0	-20 0	10-190 39-130	6	50	M0 S4
Paramete	۰. ۲	40 Units	061964005 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	
			L. UZ/20	MS	MSD	921201							
MATRIX SPIKE & M	TOIL COLLC		E: 62726			627261							
a									100				
TPH - Diesel (C10-C o-Terphenyl (S)	28)	mg/kg %,		16.7		13.3	80 87		-130 -130				
Param	eter		Units	Conc.	Resu		% Rec	% Rec Limits		alifiers	_		
LABORATORY CON	TROL SAMP	LE: 62725	59	Spike	LCS		LCS	% D					
o-terbuenyt (3)					"	39-130	,	09.91		· .			
TPH - Diesel (C10-C o-Terphenyl (S)	28)	mg/kg %.			ND 77	1.7 39-130				,			
Param	eter		Units	Resul		Limit	Analyz	ed	Qualifiers	_			
Associated Lab Sam	ples: 4062	2415001, 406	52415002, 4	062415003 Blank		004, 40624 eporting	15005, 4062	2415006, 4	062415007				
METHOD BLANK:					Aatrix: Sol								
Associated Lab Sam	· 	2415001, 400	52415002, 4				15005, 4062	2415006, 4					
QC Batch Method:	EPA 3546		2445000 4	•	is Descript		015 Solid G						
QC Batch:	OEXT/1498	38			is Method:		PA 8015B N						
Pace Project No.:	4062415												
Project:	2088 NORTH	H PLANT MO	€P										

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## QUALITY CONTROL DATA

Project:	2088 NORTH PLANT MGP		-	
Pace Project No.:	4062415		· · · ·	
QC Batch:	PMST/7264	Analysis Method:	ASTM D2974-87	· · · ·
QC Batch Method:	ASTM D2974-87	Analysis Description:	Dry Weight/Percent Moisture	
Associated Lab Sar	mples: 4062415001, 4062415002, 4	062415003, 4062415004, 40	062415005, 4062415006	.*

SAMPLE DUPLICATE: 633189

Parameter		Units	4063062 Resul		Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%			5.8	5.8	0	10	· · ·
· _								
			• •					•

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# QUALITY CONTROL DATA

 Project:
 2088 NORTH PLANT MGP

 Pace Project No.:
 4062415

 QC Batch:
 PMST/7269

 QC Batch Method:
 ASTM D2974-87

 Analysis Description:
 Dry Weight/Percent Moisture

 Associated Lab Samples:
 4062415007

SAMPLE DUPLICATE: 633479

SAMPLE DUPLICATE: 633479 Parameter	·	Units	4063012001 Result	Dup Result	RPD	Max RPD	Qualifiers	
Percent Moisture	%		7.5	7.5	. 0	· 10		
					•			
					• •			
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## QUALIFIERS

Project:	2088 NORTH PLANT MO	GP		• •		
Pace Project No.:	4062415		- ·		 -	

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **BATCH QUALIFIERS**

Batch: GCSV/7879

[1] The default spike range of the standard used for QC evaluation is C10-C28. All other carbon ranges may recover outside of spike limits because they may not cover the range of the spike used.

### ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
MO	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
54	Surrogate recovery not evaluated against control limits due to sample dilution

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## **REPORT OF LABORATORY ANALYSIS**

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2088 NORTH PLANT MGP Pace Project No.: 4062415

Lab ID	Sample (D	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4062415001	062012001	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415002	062012002	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415003	062112003	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415004	062112004	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415005	062112005	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415006	062212006	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415007	062212007	EPA 3546	OEXT/14988	EPA 8015B Modified	GCSV/7879
4062415001	062012001	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415002	062012002	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415003	062112003	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415004	062112004	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415005	062112005	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415006	062212006	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415007	062212007	EPA 5035A/5030B	GCV/8585	EPA 8015B Modified	GCV/8590
4062415001	062012001	ASTM D2974-87	PMST/7264		
4062415002	062012002	ASTM D2974-87	PMST/7264		
4062415003	062112003	ASTM D2974-87	PMST/7264		
4062415004	062112004	ASTM D2974-87	PMST/7264		
4062415005	062112005	ASTM D2974-87	PMST/7264		,
4062415006	062212006	ASTM D2974-87	PMST/7264		
4062415007	062212007	ASTM D2974-87	PMST/7269		
		•			

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July 19, 2012

Glenn Luke Natural Resource Technologies 23713 W Park Rd Pewaukee, WI 53072

# RE: Project: 2088 NORTH PLANT MGP Pace Project No.: 4062930

Dear Glenn Luke:

Enclosed are the analytical results for sample(s) received by the laboratory on July 06, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

**Brian Basten** 

brian.basten@pacelabs.com Project Manager

Endosures

cc: Brian Hennings, NATURAL RESOURCE TECHNOLOGY



## **REPORT OF LABORATORY ANALYSIS**

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## CERTIFICATIONS

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4062930

Green Bay Certification IDs 1241 Bellevue Street, Green Bay, WI 54302 Florida/NELAP Certification #: E87948 Illinois Certification #: 200050 Kentucky Certification #: 82 Louisiana Certification #: 04168 Minnesota Certification #: 055-999-334

New York Certification #: 11888 North Carolina Certification #: 503 North Dakota Certification #: R-150 South Carolina Certification #: 83006001 US Dept of Agriculture #: S-76505 Wisconsin Certification #: 405132750

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# SAMPLE SUMMARY

# Project: 2088 NORTH PLANT MGP

Pace Project No.: 4062930

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4062930001	062512008	Solid	06/25/12 10:10	07/06/12 09:50
4062930002	062512009	Solid	06/25/12 16:30	07/06/12 09:50
4062930003	062812010	Solid	06/28/12 11:10	07/06/12 09:50
4062930004	062812011	Solid	06/28/12 14:00	07/06/12 09:50
4062930005	062912012	Solid	06/29/12 14:40	07/06/12 09:50
4062930006	062912013	Solid	06/29/12 15:25	07/06/12 09:50

## **REPORT OF LABORATORY ANALYSIS**



# SAMPLE ANALYTE COUNT

Pace Project No.:         4062930           Lab ID         Sample ID         Method           4062930001         062512008         EPA 8015B Modified           EPA 8015B Modified         ASTM D2974-87           4062930002         062512009         EPA 8015B Modified	Analysts HMH	Analytes Reported
4062930001 062512008 EPA 8015B Modified EPA 8015B Modified ASTM D2974-87		Reported
EPA 8015B Modified ASTM D2974-87	НМН	
ASTM D2974-87		2
	PMS	1
4062930002 062512009 EPA 8015B Modified	SKW	1
	НМН	2
EPA 8015B Modified	PMS	1
ASTM D2974-87	SKW	1
1062930003 062812010 EPA 8015B Modified	НМН	2
EPA 8015B Modified	PMS	1
ASTM D2974-87	SKW	1
1062930004 062812011 EPA 8015B Modified	нмн	2
EPA 8015B Modified	PMS	1
ASTM D2974-87	SKW	1
1062930005 062912012 EPA 8015B Modified	нмн	2
EPA 8015B Modified	PMS	1
ASTM D2974-87	SKW	1
1062930006 062912013 EPA 8015B Modified	нмн	2
EPA 8015B Modified	PMS	1
ASTM D2974-87	skw	1

## **REPORT OF LABORATORY ANALYSIS**

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## **PROJECT NARRATIVE**

Project:     2088 NORTH PLANT MGP       Pace Project No.:     4062930	·	
Method: EPA 8015B Modified		
Description: 8015 GCS THC-Diesel		
Client: Natural Resources Technologies		
Date: July 19, 2012		
	· · · ·	
General Information:		
6 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition	with any exceptions noted below.	
Hold Time:		
The samples were analyzed within the method required hold times with any exceptions noted below.		
Sample Preparation:		
The samples were prepared in accordance with EPA 3546 with any exceptions noted below.		
Initial Calibrations (including MS Tune as applicable):		
All criteria were within method requirements with any exceptions noted below.		· .
Continuing Calibration:		
All criteria were within method requirements with any exceptions noted below.		•
Surrogates:	· · ·	
All surrogates were within QC limits with any exceptions noted below.		
QC Batch: OEXT/15103		
S4: Surrogate recovery not evaluated against control limits due to sample dilution.		
• 062512008 (Lab ID: 4062930001)		
• o-Terphenyl (S)		
• 062512009 (Lab ID: 4062930002)		<b>`</b> .
o-Terphenyl (S)		
• 062812011 (Lab ID: 4062930004)		
• o-Terphenyl (S)		
• MSD (Lab ID: 632476)		
• MSD (Lab ID: 632476)		
• MSD (Lab ID: 632476) • o-Terphenyl (S)		
• MSD (Lab ID: 632476)	· · ·	

All laboratory control spike compounds were within QC limits with any exceptions noted below.

## Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### QC Batch: OEXT/15103

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 4062930002

D6: The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

- MSD (Lab ID: 632476)
  - TPH Diesel (C10-C28)

## **REPORT OF LABORATORY ANALYSIS**

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## **PROJECT NARRATIVE**

# Project: 2088 NORTH PLANT MGP

Pace Project No.: 4062930

Method:EPA 8015B ModifiedDescription:8015 GCS THC-DieselClient:Natural Resources TechnologiesDate:July 19, 2012

## QC Batch: OEXT/15103

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 4062930002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

• MS (Lab ID: 632475)

• TPH - Diesel (C10-C28)

Additional Comments:

## **REPORT OF LABORATORY ANALYSIS**

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## **PROJECT NARRATIVE**

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4062930

#### Method: EPA 8015B Modified

Description:Gasoline Range OrganicsClient:Natural Resources TechnologiesDate:July 19, 2012

#### General Information:

6 samples were analyzed for EPA 8015B Modified. All samples were received in acceptable condition with any exceptions noted below.

#### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

#### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

#### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### QC Batch: GCV/8633

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

#### Additional Comments:

#### Analyte Comments:

#### QC Batch: GCV/8628

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

• 062512008 (Lab ID: 4062930001)

- TPH (C06-C10)
- 062812011 (Lab ID: 4062930004)
- TPH (C06-C10)

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Sample: 062512008	Lab ID: 40	62930001	Collected: 06/26	12 10:10	Received: 07	/06/12 09:50	Matrix: Solid	
Results reported on a "dry-weig	ht" basis							
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Me	thod: EPA 80	15B Modified Pre	paration N	/lethod: EPA 3546	<b>3</b>		••••
TPH - Diesel (C10-C28)	119000 m	ng/kg	3950	100	07/09/12 06:58	07/16/12 12:06	<b>3</b>	٦
Surrogates o-Terphenyl (S)	0 %		39-13	100	07/09/12 06:58	07/16/12 12:06	84-15-1	S4
Gasoline Range Organics	Analytical Me	thod: EPA 80	15B Modified Pre	paration N	Nethod: EPA 5035	6A/5030B		
TPH (C06-C10)	ND m	ng/kg	758	50	07/09/12 07;36	07/09/12 17:41	ſ	D3
Percent Moisture	Analytical Me	thod: ASTM	D297 <b>4-87</b>					•
Percent Moisture	15.5 %		0.10	) 1		07/18/12 14:26	3	
·		<b>₹</b> .			× .			
Sample: 062512009	Lab ID: 40	62930002	Collected: 06/25	/12 16:30	Received: 07	//06/12 09.50	Matrix: Solid	
Results reported on a "dry-weig					· · · ·	, , , , , ,	-	
Parameters	Results	Units	Report Limit	DF	Preparéd	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Me	thod: EPA 80	15B Modified Pre	paration N	Nethod: EPA 3546	3		
TPH - Diesel (C10-C28) <i>Surrogates</i>	90.9 m	ng/kg	4.1	2	07/09/12 06:58	07/16/12 11:54	Ļ.	M1
o-Terphenyl (S)	0 %	b.	<b>39-1</b> 30	2	07/09/12 06:58	07/16/12 11:54	84-15-1	<b>S4</b>
Gasoline Range Organics	Analytical Me	thod: EPÁ 80	15B Modified Pre	paration N	/lethod: EPA 503:	5A/5030B		
TPH (C06-C10)	ND m	ng/kg	12.3	3 1	07/09/12 07:36	07/09/12 17:15	5	
Percent Moisture	Analytical Me	thod: ASTM	D2974-87					
Percent Moisture	19.0 %	,	0.10	0.1		07/18/12 14:26	3	
Sample: 062812010	Lab ID: 40	2020002	Collected: 06/28	140 44.40	Received: 07	108/12 00:50	Matrix: Solid	
Results reported on a "dry-weig			Conected. Oorze	1 ja 11.10	received. Ur	100/12 09:30	Maurx. Soliu	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Me	thod: EPA 80	)15B Modified Pre	paration N	/lethod: EPA 3546	3	· ·	
TPH - Diesel (C10-C28)	<b>5.2</b> m	ig/kg	2.0	1	07/09/12 06:58	07/16/12 11:29	)	
Surrogates o-Terphenyl (S)	. 69 %	,	39-13	1	07/09/12 06:58	07/16/12 11:29	84-15-1	
Gasoline Range Organics			15B Modified Pre				•	·
TPH (C06-C10)	ND m	ig/kg	12.	1	07/09/12 07:36	07/09/12 16:24	ŧ	
Percent Moisture	Analytical Me	thod: ASTM	D2974-87	·	`	• .		
Percent Moisture	17.1 %		0.10	) 1		07/18/12 14:27	<b>.</b> .	

Date: 07/19/2012 12:41 PM

# **REPORT OF LABORATORY ANALYSIS**

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# ANALYTICAL RESULTS

Sample: 062812011	Lab ID: 4062	2930004	Collected: 06/28/	12 14:00	Received: 07.	/06/12 09:50	Matrix: Solid	
Results reported on a "dry-weigh							· · · · ·	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
1015 GCS THC-Diesel	Analytical Meth	od: EPÁ 80	15B Modified Prep	aration N	lethod: EPA 3546	i		
IPH - Diesel (C10-C28) S <i>urrogates</i>	70100 mg	ı/kg	2560	100	07/09/12 06:58	07/16/12 12:30	)	
o-Terphenyl (S)	0 %.		39-130	100	07/09/12 06:58	07/16/12 12:30	) 84-15-1	S4
Gasoline Range Organics	Analytical Meth	od: EPA 80	15B Modified Prep	aration _. N	lethod: EPA 5035	A/5030B	•	
TPH (C06-C10)	NĐ mg	/kg	15400	1000	07/09/12 07:36	07/09/12 18:00	3	D3
Percent Moisture	Analytical Meth	od: ASTM	D2974-87					
Percent Moisture	34.9 %		0.10	1		07/18/12 14:27		
Sample: 062912012 Results reported on a "dry-weigh	Lab ID: 4062	2930005	Collected: 06/29/	12 14:40	Received: 07	/06/12 09:50	Matrix: Solid	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical Meth	nod: EPA 80	)15B Modified Prep	aration M	lethod: EPA 3546	3		
TPH - Diesel (C10-C28)	<b>4.1</b> mg	j/kg	2.1	1	07/09/12 06:58	07/16/12 11:0	5	
Surrogates o-Terphenyl (S)	60 %.		39-130	1	07/09/12 06:58	07/16/12 11:0	5 84-15-1	
Gasoline Range Organics	Analytical Meth	nod: EPA 80	015B Modified Prep	aration N	lethod: EPA 5035	A/5030B		
TPH (C06-C10)	. ND mg	ı∕kg	12.8	1	<b>07/</b> 09 <b>/12</b> 07:36	07/09/12 16:4	Э.	
Percent Moisture	Analytical Meth	nod: ASTM	D2974-87					
Percent Moisture	21.6 %		0.10	1		07/18/12 14:2	7	
Sample: 062912013	Lab ID: 406	2930006	Collected: 06/29/	12 15:25	Received: 07	/06/12 09:50	Matrix: Solid	
Results reported on a "dry-weigh Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Quai
8015 GCS THC-Diesel	Analytical Meth	nod: EPA 8	015B Modified Prep	aration N	lethod: EPA 3546	3		
TPH - Diesel (C10-C28) Surrogates	<b>7.8</b> mg	j/kg	2.1	1	07/09/12 06:58	07/16/12 11:13	7	
o-Terphenyl (S)	68 %.		39-130	1 -	07/09/12 06:58	07/16/12 11:1	7 84-15-1	
Gasoline Range Organics	Analytical Meth	nod: EPA 80	015B Modified Prep	aration N	lethod: EPA 5035	5A/5030B		
TPH (C06-C10)	ND mg	j/kg	12.5	1	07/09/12 07:36	07/09/12 19:4	9	
Percent Moisture	Analytical Meti	10d: ASTM	D2974-87					
Percent Moisture	19.7 %		0.10	1		07/18/12 14:2	_	

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# REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project:	2088 NORTH PLANT MGP					
Pace Project No.:	4062930			<u>.</u>		
QC Batch:	GCV/8628	Analysi	s Method:	EPA 8015B Modified	1	
QC Batch Method:	EPA 5035A/5030B	Analysi	s Description:	Gasoline Range Org	anics	
Associated Lab Sar	nples: 4062930001, 40629	930002, 4062930003,	4062930004, 4062	930005, 406293000	6	
METHOD BLANK:	632487	M	latrix: Solid	······		
Associated Lab Sar	nples: 4062930001, 40629	30002, 4062930003,	4062930004, 4062	930005, 406293000	6 .	
		Blank	Reporting			
Parar	neter Ur	nits Result	<ul> <li>Limit</li> </ul>	Analyzed	Qualifiers	
TPH (C06-C10)	mg/kg		ND 10	0 07/09/12 09:32		-
	NTROL SAMPLE & LCSD:	632488	632489			

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
TPH (C06-C10)	mg/kg	50	46.5	46.6	93	93	79-120	0	20	

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Project:

2088 NORTH PLANT MGP

Pace Analytical Services, Inc. 1241 Bellevue Street - Suite 9 Green Bay, WI 54302 (920)469-2436

# QUALITY CONTROL DATA

QC Batch: OEXT	/15103	Analysis	Method:	EPA 8015B M	odified					
QC Batch Method: EPA 3	546 .	Analysis	Description:	8015 Solid G	CSV					
Associated Lab Samples:	4062930001, 4062930002,	4062930003,	4062930004, 400	52930005, 4062	930006			* 4		
METHOD BLANK: 632473	- <u></u>	Ma	atrix: Solid	- <u></u>	·			·		
Associated Lab Samples:	4062930001, 4062930002,	4062930003, Blank	4062930004, 40 Reporting	•	930006					
Parameter	Units	Result	Limit ·	Analyz	edi	Qualifiers		•		
TPH - Diesel (C10-C28) a-Terphenyl (S)	mg/kg %.			1.7 07/16/12 130 07/16/12	-		_			
LABORATORY CONTROL S	SAMPLE: 632474	Spike	LCS	LCS	% Rec					
Parameter	Units	Conc.	Result	% Rec	Limits	i Qu	alifiers			
TPH - Diesel (C10-C28) o-Terphenyl (S)	. mg/kg %.	16.7	13.0	- 83		8-130 8-130				
	SPIKE DUPLICATE: 6324	75	63247	6						
MATRIX SPIKE & MATRIX S			NOD	-						
MATRIX SPIKE & MATRIX S Parameter	4062930002 Units Result	-	MSD Spike MS Conc. Resu		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qua

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## QUALITY CONTROL DATA

Project:	2088 NORTH PLANT MGP		<b>x</b>	
Pace Project No .:	4062930			
QC Batch:	PMST/7300	Analysis Method:	ASTM D2974-87	<u> </u>
QC Batch Method:	ASTM D2974-87	Analysis Description:	Dry Weight/Percent Moisture	,
Associated Lab Sa	mples: 4062930001, 4062930002	, 4062930003, 4062930004, 4	062930005, 4062930006	

SAMPLE DUPLICATE:	637452					
		4062969004	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Percent Moisture	%	18.9	20.0	6	10	

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## QUALIFIERS

Project:	2088 NORTH	PLANT MGP		
Pace Project No.:	4062930			

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

**RPD - Relative Percent Difference** 

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **BATCH QUALIFIERS**

Batch: GCV/8633

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## ANALYTE QUALIFIERS

- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
   D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
   M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- S4 Surrogate recovery not evaluated against control limits due to sample dilution.

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## **REPORT OF LABORATORY ANALYSIS**

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# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:	2088 NORTH PLANT MGP
Pace Project No.:	4062930

Lab iD	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
4062930001	062512008	EPA 3546	OEXT/15103	EPA 8015B Modified	GCSV/7936
4062930002	062512009	.EPA 3546	OEXT/15103	EPA 8015B Modified	GCSV/7936
4062930003	062812010	EPA 3546	OEXT/15103	EPA 8015B Modified	GCSV/7936
4062930004	062812011	EPA 3546	- OEXT/15103	EPA 8015B Modified	GCSV/7936
4062930005	062912012	EPA 3546	OEXT/15103	EPA 8015B Modified	GCSV/7936
4062930006	062912013	EPA 3546	OEXT/15103	EPA 8015B Modified	GCSV/7936
4062930001	062512008	EPA 5035A/5030B	GCV/8628	EPA 8015B Modified	GCV/8633
4062930002	062512009	EPA 5035A/5030B	GCV/8628	EPA 8015B Modified	GCV/8633
4062930003	062812010	EPA 5035A/5030B	GCV/8628	EPA 8015B Modified	GCV/8633
4062930004	062812011	EPA 5035A/5030B	GCV/8628	EPA 8015B Modified	GCV/8633
4062930005	062912012	EPA 5035A/5030B	GCV/8628	EPA 8015B Modified	GCV/8633
4062930006	062912013	EPA 5035A/5030B	GCV/8628	EPA 8015B Modified	GCV/8633
4062930001	062512008	ASTM D2974-87	PMST/7300		
4062930002	062512009	ASTM D2974-87	PMST/7300		
4062930003	062812010	ASTM D2974-87	PMST/7300	•	
4062930004	062812011	ASTM D2974-87	PMST/7300		-
4062930005	062912012	ASTM D2974-87	PMST/7300		
4062930006	062912013	ASTM D2974-87	PMST/7300	•	

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# APPENDIX A2

# SOIL BORING LOGS

SOIL BORING LOG INFORMATION . . . . _

. ...



•					,								e 1	of	1		
Facility/Project Name						License/Permit/Monitoring Number Boring Number SB200											
Former NSG North Plant Removal Boring Drilled By: Name of crew chief (first, last) and Firm						Date Drilling Started Date Dr							Den	ing Mathod			
Tony Roselow											ng con	proto		Drilling Method			
				al Field Services, LLC		4/23/2012					4/23/2	2012		GeoProbe			
				Common Well Name	FinalS	Final Static Water Level Sur							Bo	Borehole Diameter			
						Feet (NAVD)					(NAV			2.0 inches			
		igin -	🛛 (es	stimated: 🖂 ) or Boring Location	T	Lat					rid Lo			-			
State Plane N, E S/C/®					Long'					744 Fe	א⊠ ₀,		⊠ E 432126 Feet □ W				
1/4 of         1/4 of Section         T         N, R           Facility ID         County         St							Civil To	own/C	ity/ or `		744 10		4.	2120			
	•			Lake	ГL		Wauk							•			
Sample			· · · · ·		'			1		Soil	Ргоре	nties					
	% (मं	10	5	Soil/Rock Description					PID 10.6 eV Lamp								
0	Att. ed (;	unt	Fee	And Geologic Origin For					Sev	(tsf			>	i I	Its		
Typ Typ	gth /	ŭ	th It	Each Major Unit		CS	bic	l Tam	10.	ngth	sture	H, F	ticit x	a	, '		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet			U S	Graphic Log	Well Diagram	Ϊ£	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments		
1	60		-	0 - 0.5' FILL, TOPSOIL: (FILL), topsoil.					+	1	<u> </u>						
CS	36		-1	0.5 - 6' FILL: (FILL), dark reddish brown (5Y	'R 3/4), -		-0+0+0+0+0+0				l .						
				0-4' dry.			+0+0+0+ >+0+0+0 +0+0+0		1								
1			-2		,		>+o+o+o+o +o+o+o+o				1						
			E				-0+0+0+ 0+0+0+0 -0+0+0+0		ļ								
			-3				0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+					ĺ					
			Ē			(FILL)	010101										
			-4				010101		1		· ·						
	<u></u>		5				101010 101010		}	1	}						
2 CS	60 38			5' wet.			-0+0+0+0+ 9+0+0+0+0										
- 1	·		-6	6 - 14' POORLY-GRADED SAND: SP, dar	rk gray		<u>}+o+o+o</u>		1								
			F,	(10YR 4/1), poorly graded, mostly subrounde [few fine, mostly medium, trace coarse], no c	ed sand					1							
			-7	faint odor, no visible impacts.		· ·			i								
	-	i	8														
			F														
			-9						Į	Į			-	•			
			E 10						1								
3	48		10 -			SP						1			Free		
CS	48		E 11						1						Product sitting on		
			Ē										-		top of interval but		
	·		-12	12' -14' more gravel present.							1			l	no product		
			Ē											ł	within thesand		
			-13	14		1				1	1	1		į	sample 10-12 ft.		
			-14			_					· ·				10-1216		
				14' End of Boring.		9						· ·					
				· · · · · · · · · · · · · · · · · · ·										L			

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Alex Marson	Firm Natural Resource Technology, Inc. 23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Tel: 262.523.9000 Fax: 262.523.9001
	Template: SOII	BORING - Project: NORTH PLANT.GPL

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120111	Projec	r Nâm	10			1cense/	emit/	Monitor	ING NU	mber		Bonna	Pag Numb		of	2
Former NSG North Plant Removal						License/Permit/Monitoring Number										
						Date Drilling Started Date Dri					e Drilli	SB201 Drilling Completed 4/23/2012				ng Metho
						4/23/2012				4	GeoProbe					
Common Well Name					Final Static Water Level Surfa				Surface	Elevat	ion	orehole Diameter				
Local Grid Origin 🛛 (estimated: 🖾 ) or Boring Location 🗌						Feet (NAVD)					Feet ( Local C	(NAV	2.0 inches			
	Plane	ıдш	🛛 (e:	N, E S/C/(		La	t	° ~	1 		LocarC	na Lo	N 🛛	ſ		X E
	1/4	of	1	1/4 of Section , T N, R		Long		0	, 	" 		742 Fe	et⊡ S		32172	Feet 🗌 V
acilit	y ID			County		ate I		Civil To Wauk		ty/ or V	/illage		,	~		
San	ple		1	Lake		L		TV aux	egan	e la		Soil	Prope	erties		
				Soil/Rock Description	n					PID 10.6 cV Lamp		[				
4	Att. a od (i	Blow Counts	Depth In Feet	And Geologic Origin F					· _	20	tsf.					tt I
Number and Type	gth A	Ŭ	् म	Each Major Unit			CS	phic	l gran	10.6	ngth	sture tent	E E	Plasticity Index	9	∧ ⊂
and	Length Att. & Recovered (in)	Bloi	Dep			•	U S	Graphic Log	Well Diagram	E E	Compressive Strength (tsf)	Moisture Content	Liquid	Plastic Index	P 200	RQD/ Comments
1 CS	60 36		E	0 - 0.5' FILL: (FILL), black (10Y 2/1) \rock tragments.	), dry, large	э ,	(FILL)	-0+0+0+ 2+2+2+0	0+0+ 12+9						[	
			È1	0.5 - 2' FILL: (FILL), black (10Y 2/1)	, well grad	led,		0101010 0101010 0101010								ļ.
			Ë,	mostly subangular sand [little fine, n some gravel [mostly fine], moist, so		rsej,	(FILL <b>)</b>	040404		1	{	Ì	ļ			,
			E ⁻²	2 - 5.5' WELL-GRADED SAND; SI (10YR 3/6), well graded, mostly suba	W, dark br					}		ł	{	}	ļ	
			<u> </u>	[few medium, some coarse], mostly	gravel [m	nostly				]	)	ļ			1	
			E	fine], odor present, wet, MGP-like od	lor at 5.5'.								1			
			<b>E</b> ⁴				sw							1		
	60 40		È-5				1				1		-			
2 :S		ĺ	Ę	5.5 - 15' POORLY-GRADED SAN	D. SP. da	k'orav				·		)	}			ļ
			-6	(10YR 4/1), poorly graded, mostly	sand [few !	fine,										
			E_7	mostly medium], no odor, moist, no v 11'.	visuarimpa	acisio	ĺ					ł	(	1		-
			Ē									1		}		ł
			<u>-</u> -8		•								1	}	<u> </u>	
			È,				1									
			9  -				1			l		ł	{	· ·		
3	60 42	1	E-10					525				}		1		
s			E				SP							)	.	,
			F-11	11' -13' oil coated.						ľ						11'-13'
Ĩ		:	-12	<b>i</b>			1	1.		1		{		{	1	sample
ł			E							}	}					
			-13	· ·												
			- 14													
		1	Ē						1		1					1
	ļ		-15			_	<u> </u>	1.9 2.	]	<u> </u>	<u> </u>				<u> </u>	
	•	fy that	the info	ormation on this form is true and correct		<u>`</u>					<u> </u>			<b>-</b>		
ignat	ture /	Éle	in /	Fin Fin	Inatu	ral Reso					111 630			2.523.9		
	0				23713	W. Paul	Koad,	Suite L	, rewa					2.523.9		H PLANT

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	<u> </u>		TEC	HNOLOGY Boring Number SB201						_	Pag	ge 2	of	2
Sam								dun		Soil	Рторе			
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 CS	60 36		16	15 - 20' POORLY-GRADED SAND: SP, gray (10YR 6/1), poorly graded, mostly sand [few fine, mostly medium], odor present, MGP-like odor.	SP			,					<u> </u>	difficulties advancing geoprobe through sand, Cabeno broke two rodsd and may need to bring in atlemative equipment. Move to
			20	20' End of Boring.	· · · · · · · · · · · · · · · · · · ·		-							next location to see if problems persist.
													•••	
									-					
			-					-						
					-				÷					
		-						- -						



												· <b>-</b>	1		<b>`</b>
acilit	у/Ргојес	t Nani	e		License/	Permit/	Monitor	1119 N	umber	<u>,</u>	Bonne	Pag Numbe	ge l	of .	2
				lant Removal								SB2			
oring	, Drilled	By: 1		f crew chief (first, last) and Finn	Date Dri	lling S	arted		Da	te Drilli				Drill	ing Method
	y Rose													ļ	
Cab	eno En	ivorr	imenta	I Field Services, LLC			/2012				4/23/2	2012			oProbe
				Common Well Name	Final Sta				Surfac	e Elevat		T1)	Bo		Diameter
ocal	Grid Or	inin	M (es	stimated: 🔯 ) or Boring Location 🔲	<u> </u>	eet (IN	AVD)			Local C	NAV			2.0	inches
	Plane	501		N, E S/C/N	Ĺa	it	°	<u>'</u>	11			N 🛛	т		×Ε
	1/4	of	1	/4 of Section , T N, R	Lon	g	•	1	"	4691	731 Fe	et S		32144	Feet 🗌 V
acilit	y ID			County	State		Civil To	own/C	ity/ or `	Village					
	:			Lake	L		Wauk	egan							
San	nple	•							đ	<u> </u>	Soil	Prope	erties		
	ઝ ઊ	S	et	Soil/Rock Description					PID 10.6 eV Lamp	90		1			
ຼຼ	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	And Geologic Origin For					6 e1	t (ts	9		کړ ا		nts
and Type	gth ove:	C ≷	th I	Each Major Unit		CS	Graphic Log	Well Diagram	10.	ngtl	istur	ti ti	Plasticity Index	200	D/
and	Len Rec	Blo	Der			US	Gra Log	We Dia		Compressive Strength (tsf)	Moisture Content	Liquid	Plastic Index	P 2(	RQD/ Comments
s	60 33.6		Ē	0 - 2' FILL; (FILL), dry, topsoil and fill.		]	010101								
	55,0		E-1			(FILL)	0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+		1						
			F			[(i ): L,	0+0+0+0+ 0+0+0+0+				1				
			-2	2 - 6' POORLY-GRADED SAND: SP, very	dark	· ·	0+0+0+								
			Ë,	brown (10YR 2/2), poorly graded, mostly sa medium, mostly coarse], wet, no visual impa	nd flittle	1									
			-3	medidin, mosty waisej, wei, no visuaninpa	CIS.				1						
			E-4			SP									
			E			or or									
2	60		-5											1	
2 ;S	36													1	1
			E 6	6 - 25' POORLY-GRADED SAND: SP, gra	iyish	1								:	
			E ₇	brown (10YR 5/2), poorly graded, mostly sa fine, mostly medium], trace rounded gravel [	and [few mostly			Į							
			Ë	fine], wet.				ł							
			-8												
			E												
			-9				1.1	5							
		•	E 10												
3 25	60 38.4		F	· · · ·				]							
,5	30.4		En			SP		ľ							
			Ē					1							1
			- 12					1			1			1	1
			E						·	1.	1		.		
			= 13	· ·						1		1			
			E-14					1		1	1				Í .
			Ē					]		1					
			- 15			1		1	- I - '	1	1	1	1	1	1

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Color Margan	Finn	Natural Resource Technology, Inc. 23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Tel: 262.523.9000 Fax: 262.523.9001
		Template: SOIL	BORING - Project: NORTH PLANT.GPJ



				Boring Number SB202								ge 2	of	2
Sar	nple							dun	<i>'</i>	'Soil	Prope	rties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture. Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 CS 5 CS	60 48 60 33.6		16 17 18 19 20	6 - 25' POORLY-GRADED SAND: SP, grayish brown (10YR 5/2), poorly graded, mostly sand [few fine, mostly medium], trace rounded gravel [mostly fine], wet. (continued)	SP									
			21 22 23 24 24 25	25' End of boring.										Gray clay noted at 25'.
											•			Attempted to collect interval 25'-30' without success.
		· ·					•							



				HNOLOGY									Pag		of .	2 .
Facility				lant Removal	E	.icense/	Permit.	Monitor	nn <mark>g N</mark>	uinber		-	Numb SB2			······
				of crew chief (first, last) and Firm		Date Dri	lling St	arted		Da	te Drilli				TDrill	ing Method
_	Martir	-			-											llow stem
			огрога					/2012				6/21/2	2012		au	ger
				Common Well Name	F			er Leve		Surface	e Elevat			Bo		Diameter
Local	Grid Or	inin	M (at	stimated: 🔀 ) or Boring Location 🗌		F	eet (N	AVD)		<u> </u>	Feet ( Local (	(NAV			_ 8.3	inches
State		igui		N, E S/CN		La	t	°	<u> </u>	"	LUCAIC		N 🖾			⊠е
	1/4	of	1	1/4 of Section , T N, R		Lon	g	°	<u> </u>	"	4691	732 Fe	et⊟ S		32143	Feet 🛛 W
Facilit	y ID			County	Sta			Civil To		•	Village			·	-	
				Lake	П	<u> </u>	<u> </u>	Wauk	egan	1						
San	ple									PID 10.6 eV Lamp		Soil	Ргоро	erties	-	
	Length Att. & Recovered (in)	nts	eet	Soil/Rock Description						ΛΓ	s Ç					
Pc Pc	h Att ered	Court	LI F	And Geologic Origin For			5	.9	9	).6 e	th (t	불법		ĮĮ.		ients
Number and Type	Length Att. Recovered	Blow Counts	Depth In Feet	Each Major Unit			sc	Graphic Log	Well Diagram	DI	Compressive Strength (1sf)	Moisture Content	Liquid	Plasticity Index	200	RQD/ Comments
<u>ź</u> 1   /	ມື <u>ຜ</u> ື 24			0 - 1' POORLY-GRADED SAND: (FILL),	bloo		<u> </u> >	64	≥ ¤		្ត្រស្ត	Σŭ		집표	Ê.	2 in. Split
ss∦	19	1 7 7 3	E	(10YR 2/1), dry, few cinders, few slag.	Diac	κ.	(FILL)				ļ			}		Spoon and
ΙÅ		3	E	1 - 1.5' FILL: (FILL), yellow, weathered cor	ncret	e.	(FILL)			0	ľ					140 lb Hammer.
Ľ			<b>E</b> _2	1.5 - 4' POORLY-GRADED SAND: (FILL (10YR 2/1), dry, few cinders, few slag.	), bla	ack			}	•			. 			
2 SS	24 6	2 2 3 2	Ē				]		}	0		]	·			Poor Recovery.
X		2	-3	, ,			(FILL)			0						
$\mathbb{N}$			Ē,								ŀ					
3 55	,24 18	2 3 2 3	<b>F</b> ⁴	4 - 5' POORLY-GRADED SAND: (FILL), (10YR 2/1), wet, few cinders, few slag, dies				8888 8988		3.5					ĺ	
33 1	10	3	E-s	odor.			(FILL)			5.5					1	
- 1			Ē	5 - 25' POORLY-GRADED SAND: SP, g brown (2.5Y 5/2), mostly sand [some fine,	rayis som	sh ne				0.0					Į	
4 SS //	24	4	<u> </u>	medium, few coarse], wet, odor is present t	oa	depth				16.2						
ss	19	4 5 7		of 9', diesel-like odor, sheen is present to a 7'.	ι	·					[	[		[	[	
IV.			È						]	1.4						
5	24	2	-8							16.2			•	1		
5 SS	21	2 5 5 5	E_9									Í		[ .	[	
Á			Ē	· · ·						0.3					1	
e F	24	8	E-10	10' - 11' diesel-like odor.			SP			6.2						
6 SS	17	8 7 8 12	Ē							0.2	1	[	1	1	ĺ	
Å		. "	E							0.4						At
			E-12											1		approximately 14' start
7 SS	24 20	8 11 15	E .	12' - 14' diesel-like odor.			1			1.6					{	adding mud while drilling
·		15	-13							6.2						to keep
1			F.				ļ									sand from clogging
8 SS (	24 22	11 13 15 17	⊨ 14 E	14' -16' no diesel-like odor.						0.1		Ì				augers.
<u> </u>		17	<u>= 15</u>	<u> </u>				1.	*	·						
I here	by certi	fy that	the info	ormation on this form is true and correct to the	best	of my l	mowle	dge.								
Signat	ure	3	ļ.					Techn					Tel: 26			
	/	<u></u>	- 11-		713	W. Pau	l Road,	Suite I	), Pew				ax: 26			TH PLANT.GPJ
										10	piate.	<del>ت</del> ا سارپ	UNDIG	Tojec		



			TEC	HNOLOGY Boring Number SB202B							Pag	ge 2	of	2
Sar	nple	··· •						du		Soil	Prope			
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram		Compressive Strength (Isf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 24	8 13 15 16	16	5 - 25' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [some fine, some medium, few coarse], wet, odor is present to a depth of 9', diesel-like odor, sheen is present to a depth of 7'. (continued)				0.2 0 0						
10 SS	24 20	5 15 16 15	18					0 0						
SS	24 24	10 12 23 30	20 21 21	20' - 22' fine grained sand content increases with depth.	SP			o o						
12 SS	24 24	6 6 9 20	-22					0.1 0						
13 SS	24 24	6 7 10 20	24 25 26	24.8' - 25' little (20%) rounded gravel [mostly fine]. 25 - 26' LEAN CLAY: CL, trace gravel [mostly fine], trace silt. 26' End of Boring.	CL			0.1 0					•	>4.5 tsf compressive strength
				20 End of Boling.										
						-	-							
						. !					-			
						1 1					1			}



Facility	Projec	t Nam	e —		License	Permit/	Monitor	ing Nu	nber		Bonng		ge -1 er	of	2
Forn	ner NS	SG N	orth P	lant Removal	{					1	_	SB2	03		
-		•	Name o	f crew chief (first, last) and Firm	Date Dr	illing St	arted		Dat	te Drilli	ng Con	pleted	·	)	ing Method
	Martin					<i>C</i> /21	/2012				(101/0	012			llow stem
lest	Servi	ce Co	orporat	Common Well Name	Final St		/2012	1 10		Elevat	6/21/2	.012			ger Diameter
				Continon wen Name			AVD)			Feet		m			inches
Local C	Grid Or	igin	🕅 (es	timated: 🛛 ) or Boring Location 📋	<u></u>		<u>II ( D)</u>			Local C					щенез
State F		0	<b>—</b> 、	N, E S/C/N		at	<u> </u>	<u> </u>	"			🛛 N	I		Б
	1/4	of	1	/4 of Section , T N, R	Lor		<u> </u>	1	'		747 Fe			32077	Feet 🗍 W
Facility	D				State		Civil To		y/ or \	/illage		-			
	,		<u>,                                    </u>	Lake	IL	l	Wauk	egan		<del></del>					······································
Sam	· · · · · ·		1						dua		Soil	Prope	erties	<b></b>	
	<u>क्ष (म</u>	. 29	et	Soil/Rock Description					ľ.	00					
. ي	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	And Geologic Origin For		}			PID 10.6 eV Lamp	Compressive Strength (tsf)	5		2		nts
Typ	Sth.	ŭ	th Ir	Each Major Unit		C.S	phic	tran:	10.(	upre.	sturv	it d	x	0	mei
Number and Type	le n	3lov	Cept	- -		ns	Graphic Log	Well Diagram	g.	Com/	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
111	24		-	0 - 2.2' POORLY-GRADED SAND WITH S	ILT:	+	<b>U</b>		- <del>14</del> 0	100	20				2 in. Split
ss	19	3 5 8 10	Ē	(FILL), brown (10YR 4/3), mostly sand [mos	tly fine],	1				(	(		Í	-	Spoon and
- IVI		10	<u>-</u> 1	few gravel [mostly fine], dry, trace slag at su	inace.	(FILL)			0						140 lb Hammer
¶ ≬	1		È,		/					1	1	-	[		
$\frac{2}{SS}$	24	2 4 5 4	<u>-</u> 2	2.2 - 3.6' POORLY-GRADED SAND: (FILL	), light	+	<b>110</b>		0	1		ļ	]	]	}
55 M	18	5 4	-3	brown (10YR 6/2), mostly sand [some fine, s		(FILL)							1		
M	·		Ē	medium, few coarse], dry, trace wood chips.		(FILL)			0	ļ				ļ	
_ Н	~		-4	3.6 - 6.8' WELL-GRADED SAND: (FILL), di	ry,				•						
$\frac{3}{55}$	24 15	4 6 8 4	Ē	black to brown, few cinders, few slag.					0		1				
<u>y</u>		4	-5			1			0		ļ	· ·			ł
$\mathbb{N}$	·		F I			(FILL)			U						
4 H	24	12	F-6	5.8' wet.					o		İ				
ss∦	20	12 5 6 8	Ē				1.20		- T					Ì	
I Ål		ŭ	E7	6.8 - 24' POORLY-GRADED SAND: SP, m sand [some fine, some medium, trace coarse	nostly				0	1		]	ĺ		
$\square$			Ē.	gravel [mostly fine], wet, gray (2.5Y 5/1) to gr		1				1		1	1	]	
5	24	5 6 8	-8	brown (2.5Y 5/2), trace wood chips.					0			1			
ss	22	6 8	E_9		·					1				[	}
			Ę						0			ļ	Į	1 ·	}
_ []			F-10									Ì			ļ
6 SS	24 24	5 7 10	E				137		0		}	}	1		
		10 14	-11			SP			0		ļ	Į			
$\mathbb{A}$			F						0	}		}	1	1	At approximatel
-7 H	24	7	-12						0			ł			14 start adding mud
ss M	24	7 6 12 · 18	E	4			1.0.1					l	{	1	while drilling
· X		10	-13						0		1	1	1		to keep sand from
			F.				377						{	1	clogging
ss X	24	8 11	E ¹⁴	14' - 15' increased fine grained sand content	t		1.		0		ļ		1	]	augers.
22 M	24	11 13 12	E15				1.1					ł	1		
[ harah				mnation on this form is true and correct to the be		knowle				<u> </u>	<u> </u>	<u> </u>		4	, <b>I</b>
				Eim				<u> </u>							<u> </u>
Signati	تالل	Tra	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		ural Res					WI 220			2.523.9 2.523.9		
			$\sim$	23/1	3 W. Pau	i Koad,	suite L	, rewa	икее,	WI 220	72 F	ax: 20	c.523.9	001	

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Sample         Suil Properties           a digned         gifted         g					Boring Number SB203							Pag	ge 2	of	2
9         24         6.8 - 24 POORLY-GRADED SAND: SP. mostly sand forme fine, some medium, trace carears, trace gravel (mostly fine), wet, grav (2.5Y 5/1) to gravish brown (2.5Y 5/2), trace wood (tipe, (continued) 15' - 24' some fine grained sand, some medium grained sand.         0         0           10         24         4         1         -11         0         0           10         24         4         -13         0         0         0           11         24         4         -20         -21         0         0         0           12         24         4         -21         -21         0         0         0           13         24         4         -22         -21         -22         coble.         0         0           13         24         6         -21         -22         coble.         0         0           13         24         6         -23         -24         24' coble.         0         0           24         9         -24         -24         -24         -24         -24         -24         -24         -24         -24         -26         -26         0         0         0         0         0           24         9         <	Sar	·							dar		Soil	Prop	erties		
9         24         6.8 - 24 POORLY-GRADED SAND: SP. mostly sand forme fine, some medium, trace carears, trace gravel (mostly fine), wet, grav (2.5Y 5/1) to gravish brown (2.5Y 5/2), trace wood (tipe, (continued) 15' - 24' some fine grained sand, some medium grained sand.         0         0           10         24         4         1         -11         0         0           10         24         4         -13         0         0         0           11         24         4         -20         -21         0         0         0           12         24         4         -21         -21         0         0         0           13         24         4         -22         -21         -22         coble.         0         0           13         24         6         -21         -22         coble.         0         0           13         24         6         -23         -24         24' coble.         0         0           24         9         -24         -24         -24         -24         -24         -24         -24         -24         -24         -26         -26         0         0         0         0         0           24         9         <	Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	And Geologic Origin For	sc	Graphic Log	Well Diagram	PID 10.6 eV La	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	X		4 11 15 20		sand [some fine, some medium, trace coarse], trace gravel [mostly fine], wet, gray (2.5Y 5/1) to grayish brown (2.5Y 5/2), trace wood chips. (continued) 15' - 24' some fine grained sand, some medium				0						
11       24       18       7       -21       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0 <td>10 SS</td> <td>24 20</td> <td>4 11 12 13</td> <td>E</td> <td></td> <td>, ,</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td>	10 SS	24 20	4 11 12 13	E		, ,						-			
12     13     13     15     12     15     16     17       13     14     14     14     14     14     16     17       13     14     14     14     17     125     10     10       13     14     14     14     14     14     16     10       13     14     14     14     14     16     10     10       13     14     14     14     14     16     10     10       13     14     14     14     14     16     10     10       14     14     14     14     16     16     16     16       14     14     14     16     16     16     16     16       15     16     16     16     16     16     16     16       16     16     16     16     16     16     16     16       16     16     16     16     16     16     16     16       17     15     16     16     16     16     16     16       16     16     16     16     16     16     16     16       16     16	11 SS	24 18	4 8 9 7	E		52			-				-		
SS 24 24 24 25 LEAN CLAY. CL, gray (2.57 5/1), face sand [some fine, some medium], trace gravel [mostly fine], little silt, wet, till. CL 0 26' End of Boring.	12 SS	24 13	67 15 15 18	Ē	22' cobble.									-	pushed
25° End of Bonng.	13 SS	24 24	13 14 15 17	Ē	sand [some fine, some medium], trace gravel	CL									
	Ľ			-26	26' End of Boring.										
											-		,		
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	iy/Proje mer N			lant Ren	noval		License/	remuu	MODITO	nng Nu	moer	ľ		Number SB2			
					ief (first, last) and l	Finn	Date Dri	lling St	arted		Dat	e Drilli				Drill	ng Method
Joe	Marti	n			,			-					-	-		ho	llow stem
105	st Servi	ice Co	orpora	tion	C	mmon Well Name	Final Sta		/2012	1 1	Surface	Elevat	5/22/2	2012	Bo	au;	ger Diameter
	,						1		AVD)	1		Feet (	NAV				inches
	Grid O	rigin	🛛 (e:	stimated:	) or Boring		La		0	7	"	Local C	irid Loo		<u>-</u> ,~		· · ·
State	Plane 1/4	of	1	/4 of Sect	N, E	S/C/(N) N, R	Lon		0	,	,,	4601	727 120	N ⊠ et⊟ S		27096	⊠ E Feet ⊡ W
Facili		01			County		State		Civil To	own/Ci	y/ or \		151_10			2030	
				[	Lake		IL	[	Wauk	egan							
Sa	mple							ł			PID 10.6 eV Lamp		Soil	Prope	erties	· · · · · · · · · · · · · · · · · · ·	
	8 (E	ıts	eet	1		Description		}	}	7	Γ Γ	st) e		]	}		
ne De	h Att ered	Cour	InF			gic Origin For		. s	.9	ផ	).6 e	th (t	t ie		ity		ents
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet		Each N	fajor Unit		sc	Graphic Log	Well Diagram	A	Compressive Strength (tsf)	Moisture Content	Liquid	Plasticity Index	200	RQD/ Comments
28	24		<u>L</u> <u>A</u>	0-43	FILL WELL-GR	ADED SAND: SW,	trace	12	01	≥ ∩	<u> </u>	10 %	Σŭ	23	E d	<u> </u>	⊇ ŭ 2 in. Split
ss	16	3 5 18 21	Ę.	gravel	[mostly fine], dry, t	prown to black, trace	e slag.						ļ				Spoon and 140.lb
Į	¶`		Ē				•				0	}	ļ	]			Hammer.
2	24	8	<u>-</u> 2	2-13	sand is oil coater	1 and oil wetted, mo	etly	(FILL)			0.4			l			
ธริ	12	8 7 5 4	È.	black n	nalleable viscous v	veathered NAPL, M		SW			0.4		· ·				
l li	{}			oaor. a	lry to moist.			· ·			243		ł	{			
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3 SS	24 22	3 2 2 2	È	4.3 - 6	FILL, POORLY-	GRADED SAND:	SP,				l l						
	N ·		5 F	fine], m	noist, oil coated, M	l), mostly sand [m GP-like odor, 30% s	stained	(FiLL) ⊡SP			145			1	ł	<b>i</b> .	(
. (	24	2	-6	black.		RADED SAND: SF	<u>-</u>			1	8.9			·	1		
4 SS	24 17	2 3 4 50(37)	E_7	grayish	brown (2.5YR 5/1	), odor present, shi	en, wet.	(FILL)		]	0.0	1		1			
	λI		Ē	1				(FILL) SP		]	22.9	·					
Ľ	4		F-8	  ∖7.9' ch	nips of weathered o	concrete.		, <b> </b>	1993		14.2					1	Refusal at
	1				l of Boring.					l I	14.2	( ·	Í	1	1		8. Possible
		ļ	ł								1			}		ł	rebar in concrete.
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		fy that	the inf	ormation of	on this form is true	and correct to the b			·								
Signa	ature	B	-1	/			ural Res 13 W. Pau					WT 520			2.523.9 2.523.9		
	/					237	1.) W. FAU	i Koau,	Suite L	7, 1 GW2				_			H PLANT.GPJ



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Facility Forr				lant Removal		COLEC/P		wienno	111R 14	anoci.		L DOLUI		04B		
				f crew chief (first, last) and Firm	Da	ate Drill	ling St	larted		Da	te Drill	ing Co			Dril	ing Method
	Martin t Servi		orpora					/2012					2012		au	llow stem ger
-				Common Well Name	Fi			ter Leve		Surfac	e Eleva			Bo		Diameter
Local	Grid Or	igin	XI (es	stimated: 🛛 ) or Boring Location 📋	<u> </u>	F0	et (IN	AVD)	_		Feet		ocation		0.5	inches
State I	Plane	- ,		N, E $S/C/\mathbb{N}$		Lat		• 	'	** 			1			ΒE
Facility	1/4	ot		/4 of Section , T N, R	State	Long		Civil T	own/C	itv/ or `		739 F	eet S	<b>5</b> 4	32085	Feet 🗌 W
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San	ple					.		1	<u> </u>	1	T	Soi	1 Ргор	erties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fect	Soil/Rock Description And Geologic Origin For Each Major Unit			JSCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture	Liquid	Plasticity Index	P 200	RQD/ Comments
<u>_2 a</u>	<u>ч «</u>	Щ		0 - 8' Blind Drill to 8 feet, see SB204 log.			D			<u> </u>	00			14 H	<u> ~</u>	_ <u>≈</u> ∪
			1 2 3 4 4 5 7				-						•			
ss	24 12	2 5 8 8	-8 	8 - 14' POORLY-GRADED SAND: SP, dan (10YR 4/1), trace gravel [mostly fine], faint MGP-like odor.	k gr	ay				3.8 4.6						At approximate 14' start adding mud while drilling
6 SS	24 20	5 8 11 12	10	10' no odor, no visual impacts. 10.5' rock fragments with staining and odor.			SP			2.7 0.8						to keep sand from clogging augers.
ss /	24 16.	3 6 6 10	12	12.5' yellow brick fragments (1 inch diameter staining and MGP-like odor. Sand has no odo	r) wi or.	ith			-	6.2 0.4						
ss 🛛	24 18	5 5 18 20	-14	14 - 23.7' WELL-GRADED SAND: SW, gra brown (2.5Y 5/2), wet, no odor, no visual imp	yish acts	3.	sw			0.1			. 			
I hereb	-		<u> </u>	prmation on this form is true and correct to the be				lge. Techn	<u> </u>	<u> </u>	·]	<u> </u>	Tel: 26	2 522 0	000	<u> </u>

 In Image: Natural Resource Technology, Inc.
 Tel: 262.523.9000

 23713 W. Paul Road, Suite D, Pewaukee, WI 53072
 Fax: 262.523.9001

 Template: SOIL BORING - Project: NORTH PLANT.GPJ



Sample			Boring Number SB204B				đu		Soil	Рад Ргоре		of	
and Type Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagranı	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200 🌷	RQD/ Comments
24 5 22	13 18 20 22	16	14 - 23.7 WELL-GRADED SAND: SW, gravish brown (2.5Y 5/2), wet, no odor, no visual impacts. (continued)				0 0 0				· · · · · ·		
24 23	15 13 19 22	- 18	18' trace fine gravel.	sw			0 0.					-	
1 24 3 23	14 16 17 19	20 21					0.1 0.1						
24	19 12 22 24	-22 -23		      .			0 0						
	-	-24	23.6' Some (40%) fine gravel. 23.7 - 24' LEAN CLAY: CL, dark gray (10YR 4/1), few sand [mostly fine], dry to moist. 24' End of Boring.	CL							-		Compress strength >4.5 tsf.
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Fasting-Project Name         Decksor/Project Name         Borner NSC North Plant Removal         Decksor/Project Name         Borner NSC North Plant Removal         Date Drilling Number         SEEDOS           Bering Drilled By: Name of crew chief (first, lan) and Firm         Date Drilling Stand         Date Drilling Completed         Drilling Method           Text Service Corporation         Common Well Name         Final State Velocity         State Plano         State Plano         N         Feet (NAVD)         Feet (NAVD)         Rectored Name         State Plano         N         State Plano         N         State Plano         Local Grid Origin         Soil Properties         N         State Plano         Issoil Velocity         State         State Plano         N         Soil Properties         Soil Properties         Soil Properties         Soil Properties         N         Soin Soil Properties											· .	_		ge l	of	2		
Baring Dolled By: Name of crew chief (five, last) and FirmDate Drilling StanedDate Drilling StanedDate Drilling StanedJoe Drilling CompletedDate Drilling StanedCounton Well NumeFrail Static Water LevelSurface ElevationBorchole DiameterCounton Well NumeFrail Static Water LevelSurface ElevationBorchole DiameterCounton Well NumeFrail State VelSurface ElevationBorchole DiameterCounton Well NumeFrail State Colspan="6">Count ConstructionBorchole DiameterCounton Well NumeFrail State Colspan="6">Count Counton Well NumeFrail State Colspan="6">Count Counton Well NumeTotal CountonState PlaneSoll PropertiesTotal CountonSame of crew chief (five, last) and FirmIde Soll/Rock DescriptionTotal CountonDate Drilling MethodIde Soll/Rock DescriptionTotal Soll/Rock DescriptionTotal CountonSoll PropertiesTotal CountonSoll/Rock DescriptionTotal CountonSoll/Rock DescriptionTotal CountonSoll/Rock DescriptionTotal Soll/Rock DescriptionTot						License/I	Permit/	Monitor	ing Ni	umber	_							
Jee Martin Test Service Corporation6/21/20126/21/2012hollow stem augerCoattron Well Name Inter Freet (NAVD)Control Origin Freet (NAVD)Borchole Dismeter Freet (NAVD)Borchole Dismeter Freet (NAVD)Borchole Dismeter Freet (NAVD)Borchole Dismeter Freet (NAVD)Load Grid Origin State Plane I/4 of Section T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T T						Date Dri	lling St	arted		102	te Drilli					ing Method		
Test Service Corporation       6/21/2012       Jauge of the service Corporation         Common Well Name       Final Static Watter Level       Surface Elevation       Borchole Diameter         Local Grid Crigin       Common Well Name       Surface Elevation       Borchole Diameter         Local Grid Location       Local Grid Location         State Plane       N. F. S/C.O.       Lat       Local Grid Location         Test Num       Control       Local Grid Location         State       Local Grid Location         Local Grid Location         Sample       Lake       Local Grid Location         Sample       Sol/Rock Description         Test Set Visit Townecky or Village         Sample       Sol/Rock Description       Sol/Rock Description         Sample       Sol/Rock Description       Sol/Rock Description         Sample       Sample       Sol/Rock Description       Sol/Sample       Sol/Sample       Sol/Sample <th <="" colspan="2" td=""><td></td><td>-</td><td>-</td><td></td><td></td><td>Buo</td><td></td><td></td><td></td><td></td><td></td><td></td><td>ipioieu</td><td></td><td></td><td>-</td></th>	<td></td> <td>-</td> <td>-</td> <td></td> <td></td> <td>Buo</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ipioieu</td> <td></td> <td></td> <td>-</td>			-	-			Buo							ipioieu			-
Feet (NAVD)         Feet (NAVD)         8.3 inches           Local Grid Origin         [csiunated: [2]] or Boring Location         N, E         S/C(N)         Lat				orpora	tion		6/21	/2012			(	6/21/2	2012		1			
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State Plane     N, E     S/C@     Lat	<del>.</del>					<u> </u>	eet (N	AVD)							<u>    8.3  </u>	inches		
Standard     I/A of     I/A of Section     T     N, R     Long     I/A of     4691742 Feel S     432126 Feel II     W       Facility ID     County     IL     IL     Waukegan     County V     State     County V     State     County V     Waukegan       Sample     IL     Waukegan     Waukegan     IL     Waukegan     Mark County V     Soil Properties			ıgın	⊠ (e		La	t	0	•	"	Local C	rid Lo				57 -		
Facility ID       County       State       Civit Town/City/ or Village         Sample       IL       Waukegan         Sample       Soil/Rock Description       And Geologic Origin For       Soil/Rock Description         State       ID       And Geologic Origin For       Soil/Rock Description       Soil/Rock Description         State       ID       And Geologic Origin For       Soil/Rock Description       Soil/Rock Description         State       ID       County       ID       County       Soil/Rock Description         State       ID       County       Soil/Rock Description       Soil/Rock Description         State       ID       County       ID       County       Soil/Rock Description         State       ID       County       ID       County       Soil/Rock Description         State       ID       County       ID       County       Soil/Rock Description         State       ID       ID       County       ID       County       ID         State       ID       ID       ID       ID       ID       ID       ID         State       ID       ID       ID       ID       ID       ID       ID       ID       ID       ID <td< td=""><td>State .</td><td></td><td>of</td><td>1</td><td>, –</td><td>Long</td><td>σ</td><td>0</td><td>t ¹</td><td>"</td><td>4691</td><td>747 Fe</td><td></td><td></td><td>32126</td><td></td></td<>	State .		of	1	, –	Long	σ	0	t ¹	"	4691	747 Fe			32126			
Sample         Soil/Rock Description         Soil/Rock Description         Soil/Rock Description           add gas and gas	Facilit		01					– Civil Ta	wn/Ci	ty/ or								
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1       24       2       1       0       0       0       2       1       0       0       0       0       0       1       1       1       1       0       1       0       1       0       1       0       1       1       0       1       0       1       0       1       1       0       1       0       1       1       0       1       1       0       1       1       0       1       1       0       1       1       1       0       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	San	nple								du		Soil	Prope	erties				
1       24       2       1       0       -6.8' FILL WELL-GRADED SAND: SW, black (10/R 2/1), dry, brown mottling, few cinders, few slag.       0       0         2       24       3       -2       -3       0       0       0         3       24       3       -2       -3       0       0       0         3       24       3       -2       -3       0       0.1       0         3       24       5       -4       -5       -6       -6       -6' mostly wood debris, few sand, wet.       0       0         4       -5       -6       -6' mostly wood debris, few sand, wet.       7       7       -6       -6' mostly wood debris, few sand, wet.       0       0         5       24       -6       -6' wet, diesel-like odor.       -7       -7       -6.8 - 8' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), wet, diesel-like odor.       -7       -7       -6.8 - 9' OORLY-GRADED SAND: SW, dark gray (2.5Y 4/1), mostly sand [some fine, some medium, some coarsel, trace rounded gravel [mostly fine], diesel-like odor.       -9       -9       -5.8       -5.8         5       24       -6       -7       -6       -5.1'' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2).       -5.8       -5.8       -5.8         5       -7<		s) (ii	10		Soil/Rock Description			ĺ .		La	0			1				
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1       24       2       1       0       -6.8' FILL WELL-GRADED SAND: SW, black (10/R 2/1), dry, brown mottling, few cinders, few slag.       0       0         2       24       3       -2       -3       0       0       0         3       24       3       -2       -3       0       0       0         3       24       3       -2       -3       0       0.1       0         3       24       5       -4       -5       -6       -6       -6' mostly wood debris, few sand, wet.       0       0         4       -5       -6       -6' mostly wood debris, few sand, wet.       7       7       -6       -6' mostly wood debris, few sand, wet.       0       0         5       24       -6       -6' wet, diesel-like odor.       -7       -7       -6.8 - 8' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), wet, diesel-like odor.       -7       -7       -6.8 - 9' OORLY-GRADED SAND: SW, dark gray (2.5Y 4/1), mostly sand [some fine, some medium, some coarsel, trace rounded gravel [mostly fine], diesel-like odor.       -9       -9       -5.8       -5.8         5       24       -6       -7       -6       -5.1'' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2).       -5.8       -5.8       -5.8         5       -7<	Typ	gth , over	Ŭ ×	4	Each Major Unit		U	phic	l Tan	10.	ngth	stur	E. E.	ticit X	9			
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2     24     3     -2     -3     0     0.3       3     24     -3     -3     0.1     0.1       3     24     -3     -3     0.1     0.1       3     24     -3     -4     3.8' moist to wet.     0       4     24     -5     -6     6' wet, diesel-like odor.     0       -5     -6     6' wet, diesel-like odor.     7.1     -7       -6     6' wet, diesel-like odor.     5.8       5     24     -8     -9       -7     -6.8 - 8' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), wet, diesel-like odor.     5P       -7     -6.8 - 8' POORLY-GRADED SAND: SW, dark gray (2.5Y 4/1), mostly sand [some fine, some medium, some coarse], trace rounded gravel (mostly fine), sow coarse], trace rounded gravel (mostly fine), sw     3.4       -9     -9     -9     -9     -9       -9     -9     -9     -9     -9       -9     -9     -9     -9     -9       -9     -9     -9     -9     -9       -10     -9     -9     -9     -9       -11     -9     -9     -9     -9       -11     -9     -9     -9     -9       -10     -9     -10     -9     -9 <td>11</td> <td>24</td> <td>2 1</td> <td>È –</td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>2 in. Split</td>	11	24	2 1	È –			1					1				2 in. Split		
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3       24       5       4'-6' mostly wood debris, few sand, wet.       0       0         4       24       5       6' wet, diesel-like odor.       7.1       7.1         4       20       7       6.8 - 8' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), wet, diesel-like odor.       5       7.1         5       24       8       8 - 9.5' WELL-GRADED SAND: SP, grayish brown (2.5Y 5/2), wet, diesel-like odor.       5.8         5       24       8       8 - 9.5' WELL-GRADED SAND: SW, dark gray (2.5Y 4/1), mostly sand [some fine, some medium, some coarse], trace rounded gravel [mostly fine], diesel-like odor.       5.8         6       24       9       10       9.5 - 18' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2).       8.2         7       24       5       12       0.3       0.3         7       24       5       12       SW       0.4	$\square$			E4	3.8' moist to wet		SW			1								
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SS $V$ 18 $\frac{3}{9}$ $-9$ (2.5Y 4/1), mostly sand [some fine, some medium, some coarse], trace rounded gravel [mostly fine], diesel-like odor. 6 24 $\frac{3}{15}$ $\frac{10}{\frac{9}{14}}$ $\frac{9.4' - 9.5' \text{ oil coated, diesel-like and MGP-like odor.}}{9.5 - 18' WELL-GRADED SAND: SW, grayish}$ 8.2 7 SS $V$ 10 $\frac{3}{10}$ $\frac{12}{11}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{13}{13}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{13}{13}$ $\frac{12}{13}$ $\frac{12}{13}$ $\frac{13}{13}$ $\frac{12}{13}$ $\frac{12}{$	5 1	24	6	-8	8 - 9 5' WELL -GRADED SAND: SW. dark o					5.8		Į		. 				
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SS M = 10 $SW = 13$ $U.4$	M								ł									
	7		5 5	E ¹²			sw			0.4								
	55	טר	8 12	E13														
	M			Ē						0.2		1						
8 24 3 - 14 14' - 17' mostly sand [mostly fine, little medium, little 0.2	8 1	24	8	-14	14' - 17' mostly sand Imostly fine, little mediu	m. little				02	1							
SS 1 21 1 E coarse], trace gravel [mostly fine], no odor, no visual	ss∦	21	11 11 17	È.,	coarse], trace gravel [mostly fine], no odor, no	o visual			İ	1								
I hereby certify that the information on this form is true and correct to the best of my knowledge.		L			l		<u>المبار</u>	p	L	<u> </u>	L		L		L			

Signature	Firm	Natural Resource Teomology, mc.	Tel: 262.523.9000 Fax: 262.523.9001	
	-	Template: SOII	BORING - Project: NORTH PLANT	T.GPJ



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Sample		<u> </u>	Boring Number SB205	1	T	r	4	T	Soil	Pag Prope	ge 2	of	2
Number and Type Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content	Liquid	ity	P 200	RQD/ Comments
9 SS 24 22	9 11 25 25	16	impacts. 9.5 - 18' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2). (continued) 17' - 18' fine sand content increasing with depth, no odor, no visual impacts.	sw			0.2 0 0						
10 24 SS 20	8 12 14 16	- 18 - 19 - 19	18 - 23.6' POORLY-GRADED SAND: SP.				0 0						
11 24 SS 23	8 15 20 16	-20 -21		SP			0.1 0						
12 24 SS 18	9 15 13 15	-22 -23					0 [.]						
13 SS 24 14	9 11 12 13	-24 -25 -26	23.5' - 23.6' little (20%) gravel [mostly fine]. 23.6 - 26' LEAN CLAY: CL, dark gray (2.5Y 4/1), dry. 26' End of Boring.	CL									>4.5 tsf compressive strength >4.5 tsf compressive
			20 End of Boring.										strength

NATURAL Resource Technology

Loc-13		+ 81	<u></u>		<del>.</del>	cénea/l		Monto	ring Nu	mhor	+	Borne	Pag Numbe		ot	1
	<u>iy/Projec</u> mer N			lant Removal		cense/1		v1011101	ing NU	THOSE	Ì		SB2			
				of crew chief (first, last) and Firm	Da	te Dril	lling St	arted		Dat	te Drilli				Drill	ing Method
	Martin	•			1		-					•	^			llow stem
	t Servi		orpora		}			/2012				5/21/2	2012		au	ger
				Common Well Name	Fi	nal Sta	tic Wat	er Leve	ы — Г	Surfac	e Elevat	ion		Bo		Diameter
					1	Fe	et (N	AVD)	)		Feet				8.3	inches
	Grid Ör	igin	🛛 (e	stimated: 🖾 ) or Boring Location 🔲	1	La	+	ø	,	"	Local C	irid Lo				
State	Plane			N, E s/C/®				 0	1				N N			×Ε
Facili	1/4	ot	•	I/4 of Section , T N, R County S	ı State	Long		Civil T	own/Ci			750 Fe	et S	43	32118	Feet 🗌 W
1 aonn	уш				۳ ۱				cegan	iy/ 01 \	, mage					
Sat	nple		<u>r</u>				!	India	logui	- <u>-</u>		Soil	Prope	rties		ľ
	T			Soil/Rock Description				)		PID 10.6 eV Lamp			1			
	Length Att. & Recovered (in)	ints	Depth In Feet	And Geologic Origin For			)	)	1	2	Compressive Strength (tsf)					<u>м</u>
Number and Type	h Al	Blow Counts	E				S	ic.	a	0.6	th (	Moisture Content		city		RQD/ Comments
	ic of	MO	bth	Each Major Unit			sc	Graphic Log	Well Diagram		du j	oist	Liquid Limit	Plasticity Index	200	
			<u> </u>		<u> </u>			Log Log	≥ ñ		5	Σັ	1212	Pl In	Ē.	žŭ
1 SS	24 18	2 · 3 3 4	F	0 - 0.8' FILL, SILTY SAND: SM, trace grav [mostly fine], dry, brown.	re <b>l</b>		(FILL) SM		1	0	1		)		ĺ	2 in. Split Spoon and
- iX		4		0.8 - 5.8' FILL, WELL-GRADED SAND: SW	V, d	ry,				0	Ì		)			140 lb Hammer.
V			F	brown to black, some cinders, some slag.			]		}		1					natimet.
2 SS	24 9	2	$E^2$	2' some silt, moist.			]			0	1		} .			
ss	9	2332	E3								}					
			Ē				(FILL) SW			· ·						]
_ [			E-4			i	}									
3 SS	24 18	6 7 7 9	Ē				} .			0	1					
		9	E-5					(*****			1					
. /			E							]	1					
4	24	5	F6	5.8 - 6.2' POORLY-GRADED SAND: SP, g brown (2.5YR 5/1), mostly sand [mostly fine]			SP /			1	) '		1			
ss≬	18	5 7 8 6		to wet, faint diesel-like odor.						]			)	1		
M		,	E'	6.2 - 8' WELL-GRADED SAND: SW, gravisl brown (2.5YR 5/1), little gravel [mostly fine],	h		sw			0						· .
Ľ	¥ . ]		E_8	odor.	we	ι, 110 ~				]			)			}
5 SS	24 20	4 6 9	Ē	8 - 10 POORLY-GRADED SAND: SP, gray	yish	1	}		ł	0	1		}			}
		9	<u>–</u> 9	brown (2.5YR 5/1), mostly sand [mostly fine] no odor.	], W	et,	SP			0			}			
V			E	9' some gravel [mostly fine].			}		1				}			
6	24	9 17	F10	10 - 14' POORLY-GRADED SAND: SP, mo	ostly	,	}		1	0			]			
ss	20	24 25	F	sand [some fine, some medium], trace grave fine, some medium], wet.			1		]							
- M			E ¹¹	11' wood chips, gray (2.5Y 5/1).					]	0	1		1			
L	¥		E12						1							ĺ
ss	24 24	8 11 13 24	È	12' - 14' trace wood chips, wet.			SP		1	0						
		24	E 13				}		1	0	i i					
. 🕴							}		1		1					
Ľ			F-14	14' End of Boring.			}	1.5.75	1	0			1			
							}	1			1.	}	1	1		
	<u> </u>		)	1		<u> </u>	1	l.,	<u> </u>	<u> </u>	]	<u> </u>	L	<u> </u>	l	<u> </u>
	·	y that	the info	prmation on this form is true and correct to the be				<u> </u>								
Signa	ure /	S_	_#_	Firm Nati	ural	Resc	urce '	Fechn	ology,	, Inc.	<b>NI 200</b>			.523.90		
					<u> </u>	. raul	Koad,	Suite L	, Pewa		WI 530'			.523.90 Project		H PLANT.GPJ

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	ý/Projec mer NS			lant Removal	License/	renni/l	VIUIIIOI	nıg ivu	anoer			Numbe SB2(			
				f crew chief (first, last) and Firm	Date Dri	lling St	arted		Dat	e Drillin				Drill	ing Method
	Martin	•							· }			<b>T</b>		1	llow stem
	t Servi		rporal	tion	Į	6/20/	/2012			(	5/20/2	012			ger
				Common Well Name	Final Stz			1 1:	Surface	Elevat			Bo	rehole	Diameter
				· · · ·	Í F	eet (N.	AVD)			Feet (	NAV	D)		8.3	inches
ocal	Grid Or	gin	🛛 (es	stimated: 🔯 ) or Boring Location 📋	1	``	• <u> </u>	•		Local G	rid Loo	ation			
state	Plane			N, E $S/C/N$	La	at		<u> </u>				1 N	-		🖾 Е
	1/4	of	1	/4 of Section , T N, R	Lon	g	<u> </u>	, 			743 Fe	et⊟ S	43	2179	Feet 🗌 W
acilit	y ID				State		Civil To		ty/ or V	llage					
				Lake	<u>IL</u>		Wauk	egan							
Sar	nple		] ]				ļ		đu	ļ	Soil	Prope	rties		ļ
	સ 🗐		tt.	Soil/Rock Description			ł		La		1				
	H D	unts	Fee	And Geologic Origin For			}		2°	tsf (tsf					ts
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Each Major Unit		CS	Graphic Log	Weil Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	- <del>-</del>	Plasticity Index	~	RQD/ Comments
Number and Typ	l and a l	low	epti			S	Grap!	Well Diagr			lois	Liquid	Plastic Index	P 200	
		<u> </u>	<u> </u>	0 - 0.5 FILL, WELL-GRADED GRAVEL:				<u>≯ ∩</u>		02	20	<u> </u>	E E	<u>4</u>	2 in. Split
1 S	24 18	8 8 7	Ē	n g(OL/OH)s, mostly gravel [some fine, some	9	HOUOH	s f la	[	{	1		[			Spoon an
- IX		7	-1	medium, some coarse].		1			0			}			140 ib
- {/	N I		È I	0.5 - 6' FILL, POORLY-GRADED SAND: S black (10YR 2/1), mostly sand [some fine, s					ľ			} .			Hammer.
, H	24	3	-2	medium, some coarse), dry, trace cinders, tra					0	1		· .			1
² s∏	14	3 2 2 2	F	slag.		}			ľ	}					1.
- 11		2	-3			(FILL)		1	0	<b>.</b>		ļ	ļ		Ì
	V I		Ē			SP				ł	l .	ł			1
3 [	24	3	<b>F</b> 4	3.8' wet.				1	0	{ ·		{	[	<b>.</b>	1
s	12	1 1 2	E	4' stained sand and gravel, MGP-like odor.				1	} :	ł	}	}			
		-	F-5						18.2		ł	1			Elevated
ļ	N I		E					{	1		ļ .	{			PID
4	24	4	<u>⊢</u> 6	6 - 9.5' POORLY-GRADED SAND: SP, bla	ck	+	1.00	]-	36.1		}	1	1	· ·	Readings
4 55	22	4 5 7	E	(10YR 2/1), mostly sand [mostly medium], n	nedium	{		]			ł			1	
			F7	sand, black (10YR 2/1), oil coated.		1			1.7	· ·	Į –		·	Ì	
V	V I		F.			SP		1	258		[		{	<b>I</b> .	{
5	24	4	E-8						137		}		1	1	
ss∥	17	4 5 12 12	Ē										ł		
			<b>L-9</b>			1			140	{	(	ĺ			
- 1	V I		F 10	9.5 - 9.9 WELL-GRADED SAND: SW, blac	×.	m SW					ł		}	1	
6 55	24	2	E ⁻¹⁰	(10YR 2/1), mostly sand [some fine, some r some coarse], oil wetted.	nedium,		1					ŀ			
ssil	21	3 9 11	E-11	9.9 - 20' POORLY-GRADED SAND: SP. g	/				}		ţ	ŀ	j		
- 1/			E	brown (2.5Y 5/2), mostly sand [some fine, s				1	101			Į		}	
Ľ	<b>\</b> .		F-12	medium]. 10.4' - 10.5' oil wetted.				1						ł	1
7 is	24 24	5 10 18 22	¢ 12	12' - 13' stained, sheen, odor present.		SP		]	18.2	1 .				ļ	1
)   °	24	18 22	E-13			SP								Į	
- 1/			£	13' - 16' sheen, odor is MGP-like.					32		]	·			
_	4	_	-14			{	120	4		1	{			{	l
8 SS	24	5 8 14	Ē	1		{		4	28.7	1	1	1		1	· ·
~ 1	¥ ~~	14	F-15				1.20	1			}	1.	1	1	1
				formation on this form is true and correct to the be					•		<u> </u>	<u> </u>	<u></u>	·	

Signature	Jatural Resource Technology, Inc. 3713 W. Paul Road, Suite D, Pewaukee, WI 5307	Tel: 262.523.9000 2 Fax: 262.523.9001
	 Template: S0	DIL BORING - Project: NORTH PLANT.GPJ



TECHNOLOGY Boring Number SB206 2 of 2 Page Sample Soil Properties PID 10.6 eV Lamp Length Att. & Recovered (in) Soil/Rock Description Compressive Strength (tsf) Blow Counts Depth In Feet RQD/ Comments And Geologic Origin For Number and Type Plasticity Index Moisture Content Liquid Limit USCS Log Well Diagram Graphic Each Major Unit P 200 9.9 - 20' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [some fine, some medium]. *(continued)* 16' - 20' trace sheen. 39 -16 7 18 24 28 9 24 9.2 at 16' start adding mud while drilling to keep sand from SS 21 -17 1.4 SP E-18 clogging 6 9 18 21 10 0.7 24 augers. E 19 SS 21 3 **⊨**20 20 - 24' POORLY-GRADED SAND: SP, gravish brown (2.5Y 5/2), mostly sand [mostly fine], trace silt, silt content increases with depth. 13 15 18 22 24 11 1 21 SS E-21 0.6 -22 ·SP 12 24 9 21 30 30 0.4 SS 14 -23 23' layer of gravel (5" thick). 0.2 23.5' no silt. -24 24 - 25' WELL-GRADED SAND WITH GRAVEL: 13 SS 10 10 16 22 24 0.1 (SW)g, mostly sand [some fine, some medium, some coarse], little gravel [mostly fine]. 19 (SW)g -25 0.1 25 - 26' LEAN CLAY: CL, dark gray (2.5Y 4/1), dry CL. to moist. -26 26' End of Boring, 0.1 >4.5 tsf compressive strength



#### Page 1 of 2 Facility/Project Name License/Pennit/Monitoring Number Boring Number Former NSG North Plant Removal **SB206B** Boring Drilled By: Name of crew chief (first, last) and Firm Date Drilling Started Date Drilling Completed Drilling Method hollow stem Joe Martin Test Service Corporation 6/20/2012 6/20/2012 auger Common Well Name Final Static Water Level Surface Elevation Borehole Diameter Feet (NAVD) Feet (NAVD) 8.3 inches 🕅 (estimated: 🕅 ) or Boring Location 🔲 Local Grid Location Local Grid Origin 0 Lat Ε State Plane N. S/CAN ØΕ ⊠N 0 1/4 of Section Т N, R Long 4691752 Feet S 432187 Feet 🗌 W 1/4 of Facility ID State Civil Town/City/ or Village County Lake IL Waukegan Sample Soil Properties PID 10.6 eV Lamp Soil/Rock Description શ્ર (વુ Compressive Strength (tsf) Depth In Feet Blow Counts Recovered ( cngth Att. And Geologic Origin For Comments Number and Type Well Diagram Moisture Graphic Plasticity ta Content Each Major Unit SCS Liquid Limit RQD/ 200 Index Log b (FILL) 24 0 - 0.5' FILL, POORLY-GRADED GRAVEL: GP, 2 in. Split . n 1 0850 GP SS 19 mostly gravel [mostly coarse] Spoon and 140 Ib - 1 0.5 - 2' FILL, POORLY-GRADED SAND; SP, dry, (FILL) SP 0 dark brown, black and red mottling. Hammer. -2 2 - 4' No Recovery. 2 Piece of 24 4556 SS D concrete in -3 shoe. 4 6 7 7 10 4-5' FILL, POORLY-GRADED SAND: SP, wet, 3 24 (FILL) SP 0.1 SS dark brown, black and red mottling. 15 -5 5 - 6.5' FILL, WELL-GRADED SAND: SW, mostly 0.3 sand [some fine, some medium, some coarse], trace (FILL) gravel [mostly fine], trace cinders, trace slag, faint SW 6 20 4 2 4 20 24 4 diesel-like odor. SS 16 6.5 - 7' FILL: (FILL), black (10YR 2/1), weathered concrete chips, MGP-like odor. (FILL) 7 11.8 7 - 7.8' POORLY-GRADED SAND WITH (SP)g GRAVEL: (SP)g, mostly sand (mostly coarse), some gravel [mostly tine], oil coated, MGP-like 8 0.2 5 24 2499 SS 15 odor. . q 7.8 - 24' POORLY-GRADED SAND: SP. dark 0 grayish brown (2:5Y 4/2), mostly sand [some fine, some medium], faint MGP-like odor. 10 6 24 10' - 24' no odor. 0.3 Recovery 231012 SS length not recorded П 0.7 at 14' start SP adding mud while drilling 12 8 13 R 29 1.4 24 to keep SS 18 sand from 13 clogging 1.1 augers. 14 12 13 19 20 8 24 D SS 20 15 I hereby certify that the information on this form is true and correct to the best of my knowledge.

 Signature
 Firm
 Natural Resource Technology, Inc.
 Tel: 262.523.9000

 23713 W. Paul Road, Suite D, Pewaukee, WI 53072
 Fax: 262.523.9001

 Template: SOIL BORING - Project: NORTH PLANT.GPJ



	<b>~</b>		TEC	HNOLOGY Boring Number SB206B							Pa	ve 2	of	2.
Sar	nple				-			ជួរ		Soil	Prope			
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Each Major Unit	nscs	Graphic . Log	Wcll Diagram		Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 21	10 14 17 17	- 16	7.8 - 24' POORLY-GRADED SAND: SP, dark grayish brown (2.5Y 4/2), mostly sand [some fine, some medium], faint MGP-like odor. <i>(continued)</i> 15' - 15.5' few (10%) coarse sand.				0. <b>1</b> 0 0				-		
10 SS	24 19	5 11 17 17	- 18	s	SP.			0 0			-			
11 SS	24 21	9 20 25 25	-20 -21	21.5' - 21.9' some (40%) gravel [mostly fine].				0 0						
12 SS	24 9	23 25 18 18	-22					0 0						
13 SS	24 18	4 12 19 30	-24	24 - 26' LEAN CLAY: CL., dark gray (2.5Y 4/1), no dilatency, medium toughness, medium plasticity, dry. C										>4.5 tsf Compressive strength.
L			-26	26' End of Boring.										>4.5 tsf Compressive strength.
														r
								~		-				
-										-				
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# Resource TECHNOLOGY

				HNOLOGY		:						Pag	e 1	of	2
Facility	-				License/I	Permit	Monitor	ing Nu	mber	h	Boring	Numbe	<del></del> -		
				ant Removal	Dete D	W 04			- 15-7	<b>D</b> 11		SB20		15-71	Maland
-		-	Name o	f crew chief (first, last) and Firm	Date Dri	und 21	апео		Date	מוחם כ	ng Con	ipietea		1	ing Method
	Martin Servi		orporat	ion		6/25	/2012		ł	4	5/25/2	012			llow stem
				Common Well Name	Final Sta			1	Surface				Bo		Diameter
		_			Fe Fe	eet (N	AVD)				NAV			8.3	inches
Local		igin	🛛 (es	timated: 🛛 ) or Boring Location 🗌		ıt	0	1	ц	local G	rid Loo				
State		c		N, E S/C/®	1		 0	,		1001		N 🛛	1		ΞE
Facilit	1/4	ot	1	/4 of Section , T N, R	Lon: State	<u>§</u>	Civil T		tv/ or V	4691 illage	735 Fe		43	2241	Feet 🗌 W
1 40	,				IL	{	Waul		.,,,	110.50					
San	ple						1		Ê	·	Soil	Prope	erties		J
	<u> </u>		L .	Soil/Rock Description			ł	}	PID 10.6 eV Lamp		[				
	tt. 8 St. 15	unts	Fee	And Geologic Origin For			1	{	· >3	sive (tsf)					ts
ber	th A vere	ີວິ	h In	Each Major Unit		CS	hic	ram	10.6	pres	ture		icity.		men
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet			U S (	Graphic Log	Well Diagram	A	Compressive Strength (tsf)	Cont	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
11	24	0		0 - 4' FILL, WELL-GRADED SAND WITH	SILT:	┼╧╴	हिंगी	2.4	0		20				2 in. Split
ss∦	20	1	Ē,	SW-SM, dry, brown to black, organics, cinde		1								li -	Spoon and 140 lb
- IA			E'	· · ·							{				Hammer.
μ		-	E_2			(FILL) SW-SM									
2 SS	24 2	3233	- -			000-00			0		ļ		ļ		Poor Recovery.
IX.		3	-3					-	0						2" of brown wet sand
$\mathbb{N}$		1								]	ŀ	{	{		and silt.
3	24	10 5 3 7		4 - 6' FILL, SILT WITH SAND: (ML)s, dark	gray	· ·		]	0	}	}.	}			
ss	12	3 7	E_5	(10YR 4/1), moist, few organics.		(FILL)				].	ł				
· -			Ē			(ML)s			1.4	ļ	Į		}		
4	24	1	-6	↓ 5.9' - 6' oil coated sand [mostly coarse], odo	or /	-	₩ŲŲĮ		1.6	ł	ļ		}		
ss	16	2	E	present, MGP-like odor.		(FILL)	SC 2		1.0	{ ·	{		{		
· · /			E-7	6 - 7.5' FILL, WELL-GRADED GRAVEL W SAND: (GW)s, mostly angular gravel [most	ly fine],	(GW)s			20.1	ł	· ·	ļ	ţ		
Ľ			Es	sheen, oil coated, odor is MGP-like.	/	1	1.1				·	ł	}		
5 SS	24 24	3 5 6 8	È.	7.5 - 25.2' POORLY-GRADED SAND: SP brown, oil wetted, stained black, MGP-like of	, grayisn dor.				. 102	}		.	1		
	27	8	<u>-</u> 9	8.3' - 8.5' oil wetted.					57.8	1	· ·				
1		[	E					1	07.0	[	1				1
6	24	1	E-10	9.7' - 10' oil wetted. 10' - 10.7' sheen, odor present.		}	34	1	26		<u> </u> .				
ss∦	24	2 1 1	Ę.,	10.7' - 11' oil coated.			31	1	1			}		}	
I/			11 E	11' - 11.5' sheen, odor.		SP			46.9		ļ	}		· ·	
_ [			E - 12	11.5' - 12' oil wetted.		{	34	1		{	1	ł	{	}	1
7 55	24 14	10 12 13 16	F	12' - 12.5' oil coated. 12.5' - 13' oil wetted, strong MGP-like odor.		{	37		74.2	[	1	1.	1		1
X	}	16	-13	13' - 14' sheen, odor.		}	1.	1	22.4		{	{	{		
ľ			Ē.,				30	1			1	1			
ss X	24	7 12 13 17	<u>⊢</u> 14	14' - 14.5' oil wetted.		1	30	4	23.7		ļ	1	1	1	
22 N	17	13 17	-15	14.5' - 15.5' sheen, odor.		}		1	ł		{	1	1	ł	1
	·	·							·	·	·	4		L	- <u></u>

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature		Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
10-11-5C	;	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
		Townlater SOF	DODDIC Business NODTH DI ANT COL

Template: SOIL BORING - Project: NORTH PL ANT.GPJ



			I I EC	HNOLOGY Boring Number SB207							Pag	7 2	of	2
San	nple	<u> </u>	, <u> </u>	Bornig Runder (SD207	1	Ţ	<b></b>	<u>e</u> ,	r	Soil	Prope		01	<u></u>
Number and Type	t. & l (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content		ity	P 200	RQD/ Comments
9 55	24 20	10 13 17 19		<ul> <li>7.5 - 25.2' POORLY-GRADED SAND: SP, grayish brown, oil wetted, stained black, MGP-like odor. (continued)</li> <li>15.5' - 16' oil wetted.</li> <li>16' - 19.7' oil wetted, strong MGP-like odor.</li> <li>17' - 17.5' oil follows lamination in sand.</li> </ul>				76.2 241 244		-				
10 SS	24 20	5 7 12 18	- 18 - 19 - 19					160 94.1						
11 SS	24 21	12 15 - 17 15	-20	19.7' grayish brown sand, sheen, odor. 20' - 20.5' oil wetted, black sand. 20.5' - 21' oil coated. 21' - 22' sheen, odor, trace emulsified NAPL (3-4mm	SP			114						
12 SS	24 20	5 12 16 17	-22	droplets). 22' - 25.2' grayish brown (2.5Y 2/1) sand, sheen (sheen in sample water, no sheen in soil matrix), odor.				5.2 5.3			  - 			
13 SS	24 19	5 8 26 13	-24					1.7						
			-26	25.2 - 25.5' WELL-GRADED GRAVEL: GW, no sheen, no odor, no visual impacts. 25.5 - 26' LEAN CLAY: CL, dark gray (10YR 2/1), dry to moist, no odor, no visual impacts. 26' End of Boring. 26' End of Boring.	CL			1.1						



T.=		+ <b>N</b> 1				· · · · · ·								e 1	of	2
	y/Projec mer NS			lant Removal		License/1	remut/	vionitor	ing Nu	niber			Numbe SB2(			
				of crew chief (first, last) and Firm	·	Date Dri	lling St	arted		Dat	e Drillin				Drill	ing Method
	Martir			- · ·	· ,						•				ho	llow stem
Tes	t Servi	ce Co	прога		Well Name	Final Sta		/2012	1 10		Elevat.	5/22/2	.012	10-		ger Diameter
				Conunion	wen name			AVD)	1 f	Surrace	Feet (		m	00		inches
Local	Grid Or	igin	🛛 (e	stimated: 🛛 ) or Boring Locatio		1		。			Local G			!		
State	Plane			N, E S/	С/00	La	it			— <u> </u>		÷ .	🛛 N			🛛 Е
17 114	1/4	of	1		1, R	Lon		0. 17		<u></u> ]		712 Fe	et S	43	32073	Feet 🗋 W
Facilit	уID			County Lake	1	ate L		Civil To Wauk		y/ or v	illage					
San	nple						ŢJ	Wauk	Ugail	6		Soil	Prope	rties		<u> </u>
				Soil/Rock Descri	ntion			1		PID 10.6 eV Lamp						
	2 E	unts	Feet	And Geologic Orig	-			1		eV	sive (tsf)					[2]
ber	Vere Vere	õ	n In	Each Major U	-		CS	hic	(am	10.6	gth	cht ture		icity		men /
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet				U S (	Graphic Log	Well Diagram	A	Compressive Strength (tsf)	Moisture Content	Liquid	Plasticity Index	P 200	RQD/ Comments
11	24	- <u>11</u> 5	<u>⊢∺</u>	0-6' FILL, WELL-GRADED S	AND: SW, mo	stly				0	00	20			· ·	2 in. Split
ss	12	52	Ē.	sand [some fine, some medium]	, some silt, dry	, dark					<b>}</b> .					Spoon and 140 lb
IA			Ē				}				u		}			Hammer.
_ [		3	E_2	) Ol. Ol block (10)(D 0(1) and any		بالد	}			0′		}	}			Deser
2 SS	24 10	1	Ē	2' - 6' black (10YR 2/1) and orai sand [some fine, some medium,	some coarse]	, few				U	Ì	ļ	1	}		Poor Recovery.
X		1	F-3	, cinders, slag.			(FILL) SW					ł	ł			
/`	V I		F.							l			1	. 		
3 SS //	24 11	4 4 5 2	<u>⊢</u> 4	4' - 6' black (10YR 2/1), wet.						0			Ì	l		
33		2	F-5							[	1	Į		ſ	1	
[^	N I		F	· ·								[	ļ	{		
4	24	5	F-6	6 - 13.4' POORLY-GRADED S	SAND: SP, mo	stly				0		}	}			
ss	16	5 6 4	E ₇	sand [some fine, some medium, grades from dark grayish brown	little coarse],	wet,	1		}	}		Į	}	1		!
۱.			E'	gray (10Y 4/1) at 7'.	(2.31 4/2) (01	Jain			}	1		]			]	
Ļ		-	E-8				,		}		}	ļ			ļ	
5 SS	24 15	5 5 6	E	8' dark gray (2.5Y 4/2), trace co MGP-like odor.	arse sand, tai	nt	}			0.1	1	Į.,		}	ļ	
1X		9	<u>-</u> 9				}		}	ŀ		{	{			
ľ			Ē				SP						{		}	
6 SS	24 23	9 11		·						0.2	1		{	ł	ł	PID reading
55	23	11 12 13	En		•								ĺ	1	1	from sample in bag
I	V		Ē	11.2' - 11.4' stained black, shee	en, faint MGP-I	ike	1		1	0.3	1			1		11'-12'
7	24	7	-12	odor, wet. 12' grådes from dark gray (10Y	4/1) to dark <b>a</b>	ravish ·				0.1	1			1	Í	
ss	24	7 9 11 13	Ē.	brown (2.5Y 4/2) with depth, tra-	ce gravel [mos	itly			]		•	[		1	!	
J.	V.	-	E ¹³	fine], faint MGP-like odor, wet.	04110 00				]				ļ		]	
	1 ~.		E14	13.4 - 21' POORLY-GRADED brown (2.5Y 5/2), mostly sand								}	}	1		
ss x	24 24	9 12 29 30	F	medium], wet, faint MGP-like od 14.4' trace gravel [mostly fine].			SP			0		}	}			
V	<u>}</u>	30	-15	. The adde graver proonly fillel.	·		<u> </u>	1.5	1	l Ľ	<u> </u>	1	<u> </u>	Ŀ	<u> </u>	<u> </u>
I here	by certi:	fy that	the info	ormation on this form is true and co		t of my l	mowie	dge.					·			
Signa	fure	Tr		tt Clause		ral Res								2.523.9		
			0		23713	W. Pau	l Road	Suite L	), Pewa					2.523.9		TI DI ANTI CON
										Te	mplate: S	SOIL B	ORING	<ul> <li>Project</li> </ul>	: NOR	IH PLANT.GPJ



<u> </u>				HNOLOGY Boring Number SB208							Pag	ge 2	of	2
Sam	· · · · · ·			-				dun		Soil	Prope	erties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fect	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquið Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 18	18 21 26 30	16	13.4 - 21' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [some fine, some medium], wet, faint MGP-like odor. <i>(continued)</i> 17.5' little gravel [mostly fine].				0						
10 SS	24 14	17 19 21 23	18	18' increasing fine grained sand content with depth.	SP			0						
ss	24 15	18 22 28 32	-20 -21	20' mostly sand [mostly fine, trace coarse], trace gravel [mostly fine]. 21 - 22.2' POORLY-GRADED GRAVEL: GP.				0 0		- -				
12 SS	24	9 12 13 14	-22 -23	22.2 - 24' LEAN CLAY: CL, dark gray (10Y 4/1), trace sand [mostly coarse], trace gravel [mostly fine], few silt, wet, till.	GP CL	000		0						Recovery length not recorded
ΞЦ			-24	24' End of Boring.	•									
				Li ala di Donig.										
	-				-									
		-												
									-					
								1						
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				·										
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							7			 i				



	-	Allow			++	· · · · · · · · · · · · · · · · · · ·	N			<u>.                                    </u>	<del></del>		e 1	of	2
Facility	-			lant Removal	License	rennit	IVIONIIOI	ng N	uinder	ĺ		Numbe SB2(			
				f crew chief (first, last) and Firm	Date Dr	illing St	tarted		Da	te Drillin				Drill	ing Method
	Martiı			· · · ·										ho	llow stem
Test	: Servi	ce Co	orporat				/2012				5/22/2	012			ger
	•			Common Well Name	Final St			I.	Surfac	e Elevat			Bo		Diameter
Local	Cita Or	igin	M (ar	timated: 🔯 ) or Boring Location	F	eet (N	AVD)		L	Feet (				8.5	inches
State I		15m		N, E S/C/N	L	at	°	•	18		nu Lo	M. N			×Ε
	1/4	of	1	/4 of Section , T N, R	l Lor	)g	0		11	4691	712 Fe	et S		3 <b>2092</b> .	Feet 🗌 W
Facility	γD			County	State	<u> </u>	Civil Te	own/C	ity/ or						<u> </u>
				Lake	<u>IL</u>		Wauk	egan							
San	ple					}			đ		Soil	Ргоре	rties		
	<b>%</b> (म्	27	t	Soil/Rock Description			1		PID 10.6 eV Lamp	96			•		
	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	And Geologic Origin For					661	ssiv 1 (ts:	ο	l	~		sta
Typ	Length Att. Recovered	Ŭ š	th L	Each Major Unit		CS	phic	1 Pran	9	apre	stur	E E	x ficit	200	
Number and Type	Len	Blo	Dep			US	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content	Liquid	Plasticity Index	P 2(	RQD/ Comments
111	24	5 5 7		0 - 0.5' TOPSOIL: OL/OH, topsoil.			$\nabla$		0	1					2 in. Split
ss	19	7 5	- 1 -	0.5 - 6' WELL-GRADED SAND: SW, dry, b black, brick, cinders, slag.	rown to	<u>, , , , , , , , , , , , , , , , , , , </u>							.		Spoon and 140 lb
$\mathbb{N}$				Diack, Drick, ciliders, slag.									{ .		Hammer.
2	24	1	-2	· · ·					0.1						
2 SS	14	1 3 2	E						1		.	{			
X			-3			sw			0					ľ	
$\square$			-4											1	
3 SS (	24 13	4 2 6 8	F*			}			• 0		{			1	
33	13	8	Es	4.5' wet.		1. ·					} ,			}	
M			Ē.			1			0,		ł		}	{	
4	24	5	-6	6 - 8.5' WELL-GRADED SAND: SW, dark	orav	+		1	0				ł		
ss∬	19	5 6 9 12	E	(10YR 4/1), few (10%) organic material (root	s), faint			1			{	· ·	{		
- IX	{	,	1-7 1-7	diesel-like odor. 7' - 8.5' no organic material.		sw			0			}	}		
$\square$		Ì	F-8								{	1	{		1
5 SS	24 18	5 6 7	È						0	1	{	ł	}		
33		1	E9	8.5 - 9' WELL-GRADED SAND: SW, most [] [mostly coarse], little gravel [mostly fine], tra	ace fluid	<u>d sw</u>			0.2	1	1	}		1.	1
N			E	emulsified NAPL droplets (1-2mm diameter),		[]			0.2	}		}			
6	24	4	-10	MGP-like odor. 9 - 23.5' WELL-GRADED SAND: SW, mos	/		3.5		0.1		1	1		[	Recovery
ss		8 10 16	F	sand [mostly coarse], little gravel [mostly fir										1	length not recorded
IX IX			F-11	grayish brown, diesel-like odor.		ļ			0	·   .	-		}		hecolded
		 _	E-12			0				1				· ·	
7 SS	· 24 18	9 7 12 - 14	Ē	12' faint diesel-like odor.		SW			0.1	1	ł.,	1			
.		- 14	-13			}		]	0.1		ł			1	} ·
$\downarrow$			Ê.			}			<b>  "</b>		ł	}			
8 SS	24	6 13	<u>-14</u>	14' no odors.					0.1		}	Į		1	
ss	22	13 15 14	-15			}		ł	}	}	}		}	1	
	<u> </u>	<u>ا</u>	<i></i>	Transform on this form is true and correct to the h		 here a sur de		l	1	J	-L	<u> </u>	<u> </u>	L	<u> </u>

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001

Template: SOIL BORING - Project: NORTH PLANT.GPJ



			TEC	HNOLOGY Boring Number SB209						Dog	ge 2		2
San	aple		í		1		đ		Soil	Prope		<u> </u>	
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fcet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log Well Diagram	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 55	24 22	12 23 21 21	16	9 - 23.5' WELL-GRADED SAND: SW, mostly sand [mostly coarse], little gravel [mostly fine], grayish brown, diesel-like odor. (continued)			0					1	
10 SS	24 19	9 12 17 19	18		sw		0 0						
11 SS	24 20	13 16 19 22	20				0						
12 SS	24 17	15 19 20 50 (37)	-22 -23	23.5 - 24' WELL-GRADED GRAVEL: GW, little			0						Soil sample is not
13 SS	24 0	23 18 24 26	-24	23.3 - 24 WELL-GRADED GRAVEL. GW, Intel 3 sand [mostly fine], mostly gravel [some fine, some 1 medium, some coarse], trace emulsified NAPL 1 present (1-3mm droplets), NAPL is in sample water, 1 NAPL does not appear in soil matrix, MGP-like odor. 24 - 28' LEAN CLAY: CL, No Recovery.	<u> </u>		5.1						representative.
14 SS	24 0	27 42 43 43	26		CL.		-						
15 SS	18 18	45 49 50 (67)	-29	28 - 29' No Sample. 29 - 29.5' LEAN CLAY: CL, dark gray (10YR 4/1). 29.5 - 30.5' SILT: ML, dry, fragments of hard silt appear like rock fragments. 30.5' End of Boring.	CL ML				-			- - -	Sampler pushing a cobble into clay, overdrilled 28-29', no sample taken.
		-		30.5' End of Boring.					,				



Facility/Pro	iect N	ame			- <del>113</del>	cense	Permit/	Monitor		niber	·†1	Bonng	Pag		of .	2
Former	NSG	Nor		ant Removal	1							-	SB2	10		
+		: Na	me of	crew chief (first, last) and Firm	Đ	ate Dri	lling St	arted		Dat	e Drillii	ng Con	pleted			ng Method
Joe Mar		<u> </u>					CDE	0010				( in c in	010		1	llow stem
Test Sei	vice	Соц	orau	Common Well Name	Fi	nal Sta		/2012 er Leve	1 15	Surface	Elevat	5/25/2	.012	Bo	aug	ger Diameter
								AVD)			Feet (		D)			inches
Local Grid	-		(est	timated: 🔯 ) or Boring Location 📋	1	· T -	•	0	, ,		Local G					
State Plane				N, E $s/c/N$		La			,		iron	:	N			, ⊠ e
Facility ID	/4 of			4 of Section , T N, R County	Stat	Lon	<u>g</u>	Civil To	wn/Cit			594 Fe		4:	52117	Feet 🗌 W
					L		1	Wauk								•
Sample							}			ਸ਼ਿੱ		Soil	Prope	erties		
a (	Î		;;	Soil/Rock Description			]		.	PID 10.6 eV Lamp					 	
Att.	8		1 Fe	And Geologic Origin For					a	6eV	ssiv 1 (tsj	a		2		nts
Number and Type Length Att.	Kecovered (11)	5 ·   ≩	Depth In Fect	Each Major Unit			CS	phic	Well Diagram	10.	npre	Moisture Content	ti di	ticit	200	
			Dep		_		US	Graphic Log	Vel Dia	E L	Compressive Strength (tsf)	Con Moi	Liquid	Plasticity Index	P 2(	RQD/ Comments
1 24 SS 12	10	4 (4 [*] ) =		0 - 2' FILL, WELL-GRADED SAND: SW, b black, material in shoe may contain brick or c	row	n to riete					[					2 in, Split Spoon and
	.	" <u>-</u>	1	fragments.	0011	1010	(FILL) SW			0				}		140 lb
M		Ē										ļ		]		Hammer. '
2 55 24 24		3 -	·2 {	2 - 6.5' FILL, POORLY-GRADED SAND: S						8				ļ	1	
55 N 24			.3	black (10Y 2/1), dry, cinders, mothball-like or some fragments have glassy luster like crees						•						
M		Ę	Ĩ	· · ·			ļ	35		7 [.]	· .	l	ŀ			
3 24		۶È	-4	3.5' - 4' red brick fragments and foundry san odor.			(FiLL) SP					ł	ł			Poor
3 SS 10	5 [.	1111	•	4' - 6' black sand, mothball-like odor, dry to r	moi	st.	SP				1	}	{			Recovery.
{Å}		`• E	-5				ł			1.4	ł	ł	}	}		ł
. Ц	. 1	E.	-6.				{				1	1	1	1	1	\$
4 24 SS 22				6' no odor, wet. 6.5 - 16' WELL-GRADED SAND: SW, gray	rich					0		{	ł		1	ł
XI		6  -	-7	brown (2.5Y 5/2), mostly subrounded to roun	ndea	1	1			0			ļ.	}		
Ŵ		Ę		sand [some fine, some medium, some coars subrounded to rounded gravel [mostly fine],	sej, i wei	irace							1	}	ł	
5 24 SS 16	ŧ	3355	-8				1.			0		ļ	1			
55 M 10	°	5 -	.9									}		ł		
N		F								0		{			1	ļ
6 24	1	ŧF	-10				}			a		}		•	}	
SS 🛛 22	2	5   - 6   -					sw					ł			ł	
N		F	-11							0		}				
-H-		, F	-12				{			0		1		}		
7 24 SS 24	1	5					{	5			[	1	1		}	1
١X		"E	-13				<i>\</i> .			σ	ł				} .	ľ
Ц		Ē	-14								{	1	{	{		1
$\begin{array}{c} 8 \\ SS \end{array} \begin{array}{c} 24 \\ 20 \end{array}$	4	8 10		14' sand is increasingly poorly graded with o	depi	sh.				0	ł		ł	}		4
N		16 F	-15	· ·			<u> </u>	1.555	<u> </u>		<u> </u>					I
I hereby ce	ntify t	bat th	e info	rmation on this form is true and correct to the b	est	of my l	nowled	ige.								
Signature	ĩ	2	4-	Firm Nat	tura	l Res	ource	Techn	ology,	Inc.				2.523.9		
	10		//	237	13 \	V. Pau	l Road,	Suite I	), Pewa					2.523.9		TH PLANT.GP



				Boring Number SB210			<i>.</i> .				Pag	e 2	of	2
Sar	nple		[					dın		Soil	Prope	rties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 ss	24 19	11 14 15 16	16	15.9' mostly fine sand. 16 - 23.6' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine], wet.	SW			0 0 0						At approximately 14' start adding mud to keepsand
10 SS	24 20	9 15 15 17	18	18' - 21' sulfur-like odor.				1.6						from clogging augers.
11 SS	24 22	15 19 18 20	20 		SP			2 0.5					•	
12 SS	24 21	8 11 23 30	-22					0 0						
Ľ			-24	23.6 - 23.7' WELL-GRADED GRAVEL: GW. 23.7 - 24' LEAN CLAY: CL, dark gray (2.5Y 4/1), trace sand [mostly coarse], dry to moist. 24' End of Boring.	GW CL	222		0						>4.5 tsf compressive strength.
														-
										•		7		
					- 			:						
					-									
								   			i			
- 、														
·		•			 									



	y/Projec				Licenser	emuv.	Monitor	nig Nu	mber			Numbe			
				lant Removal								SB2			
-		-	Name o	f crew chief (first, last) and Firm	Date Dri	ling St	arted		Dat	e Drilli	ng Con	npleted		1	ing Method
	Martir t Servi		orporat	tion		6125	/2012		1		6/2.5/2	012		1	llow sten
105	· SCIVI			Common Well Name	Final Sta			1 [3	<u>i</u> Surface	Elevat		.012	Bo		ger Diameter
						et (N	AVD)	}		Feet	(NAV	D)		8.3	inches
ocal	Grid Or	igin _.	🛛 (es	stimated: 🛛 ) or Boring Location 📋	1		.0	,		Local C	irid Lo	cation			
state .	Plane			N, E $S/C/N$	La							X			ΣE
acilit	<u>1/4</u>	of	1	/4 of Section , T N, R	l Long	3	Civil To				705 Fe	et S	4	32142	Feet 🗌 W
acing	уш			Lake	IL		Wauk		Ly/ OI V	mage					
San	nple					,/		<u> </u>	e de		Soil	Prope	erties		<u> </u>
				Soil/Rock Description		}			Lau			]			
	19. 19. 19. 19. 19. 19.	unts	Fee	And Geologic Origin For					2	sive (tsf)	}	)			হ
ype Ype	vere Vere	õ	h In	Each Major Unit		CS	bic	ram	10.6	gth	ture l	-i-	icity.	_	/ men
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fect	<b>;;;</b>		U S (	Graphic Log	Wcll Diagram	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	200	RQD/ Comments
11/	24			0 - 4.5' FILL, WELL-GRADED SAND: SW	, dry,	<u> </u>		21	<u> </u>		20			Ч	2 în. Split
ss∦	17	6 11 5 5	E,	brown to black with cinders and slag.						1	}		ļ		Spoon and 140 lb
- 14						1			Ο		ł	ł			Hammer.
, H	24	2	-2	2' dry.		(FILL)			0	ł	{.	ł			
2   5	24 4	2 2 3 2	E.	2 diy.		`sw'						ł	{		
X	(	2	-3			1			l		{	ł	ł		i
			4	· · · · · · · · · · · · · · · · · · ·								1			ļ
3 55	24 20	3 2 3 3			· · · · ·	ļ	1.55		0	{	ĺ	1		ĺ	{
Ĩ		3	<u>-</u> 5	4.5 - 8' POORLY-GRADED SAND: SP, g brown (2.5Y 5/2), deisel-like odors (wet at 4	.5').	ļ			0.3			1	<b>.</b> .		ļ
			E .			}		ţ	0.5		ļ	}			
4	24	3 3 5 5	E-6	6' 6'-8' deisel-like odors and rainbow sheen	in water,	SP		1	0.7			ł.	ļ		
ss 🛛	21	5 5		not on sand grains, at 6' sheen present.					}	ł		ł	}		· .
			Έ						0	Ì			} .	}	1
5F	24	4	<b>-</b> 8 ·	8 - 18 WELL-GRADED SAND: SW, most	ly sand	┦────			0		1	-		1	
-5 SS [/	21	4 5 5 7		[some fine, some medium, some coarse], w	et,	ł			ľ	}	1				
Ă			<u>–</u> 9	grayish brown (2.5Y 5/2), deisel-like odors, water between grains.	sneen on	1			0.7	1	1	{		ł	1
$\square$	N i		E-10	·		{			1		1	{	ŀ	l	1
6 SS	24 24	4 7 10	Ē	10' -18 faint deisel-like odor, no sheen.		{			0.4	{		ĺ.	J	l .	
- IV		10	Εu			{		1	0.1	{·	1	ĺ	1		ĺ
. //			È			sw			<b>.</b>					1	
7 ss∬	24	67	E ¹²		• •			1	0		1		}		
ss∥	22	6 7 14 15	E13										1	ļ	
		Ì	Ę						0.		}				1
8 H	24	5	-14						0.1				1		
8 55 X	20	5 12 19 19	Ē.,								ł		}	1	1
	1		<u>F-15</u>	<u></u>	·	<u> </u>	<u> </u>	1	<u> </u>	<u> </u>	<u> </u>	<u> </u>			<u> </u>

Signature South	Firm Natural Resource Technology, Inc. 23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Tel: 262.523.9000 Fax: 262.523.9001
	Template: SOII	BORING - Project: NORTH PLANT.GPJ



			TEC	HNOLOGY Boring Number SB211		• `					Dor	ge 2	of	2
Sar	nple		<u> </u>	Sound runnon ODALL	1	μ <u></u> -		dn		Soil	Prope			ī
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Linuit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 22	12 15 18 20	16	8 - 18' WELL-GRADED SAND: SW, mostly sand [some fine, some medium, some coarse], wet, grayish brown (2.5Y 5/2), deisel-like odors, sheen on water between grains. (continued)	sw			0 D 0						
10 SS	24 16	10 11 14 16	- 18 	18 - 23.5' POORLY-GRADED SAND: SP, wet, grayish brown (2.5Y 5/2), mostly fine, trace coarse sand.				0						
11 SS	24 20	10 16 20 26	-20 -21		SP			0 0		. 			•	
12 SS	24 24	22 19 18 10	22					0						23.5'-24'
Ľ		<b>.</b>	E 24	23.3' -23.5' well graded gravel no odor, no visual. 23.5 - 24' LEAN CLAY: CL, dry to moist, dark gray (10YR 4/1), trace coarse sand. 24' End of Boring.		2								>4.5 tsf compressive strength.
										-				
										, , , , , , , , , , , , , , , , , , ,				
								!						
									ļ					



-	y/Projec mer Ni			lant Removal	Lice	nse/P	¢mīt/I	Aonitor	ing Nu	nber	· ]		Numbe SB2			
oring	g Drilled	By: 1	Name o	f crew chief (first, last) and Finn	Date	Drill	ling Sta	arted		Dat	e Drillii	пд Сол	pleted		Drill	ing Metho
	Martir t Servi		orporal					2012				5/27/2	012		au	llow ster ger
				. Common Well Name	Fina			er Leve	1 [5	Surface	Elevat			Bo		Diameter
	<u></u>		57 (	stimated: 🔯 ) or Boring Location		Fe	et (N.	AVD)			Feet ( Local G				8.3	inches
	Grid Or Plane			, N, E S/C/		Lat		<u> </u>	,  1	" "			🖾 N			
acilit	1/4	ot		I/4 of Section , T N, R County S	tate	Long		Civil To				583 Fe	et⊟ S	4:	32154	Feet 🗌
acilli	уШ			3	IL.		ł	Wauk		y/ 01 1	mage					
San	mple		<b>r</b>				{	11 aux	.cgan	<u> </u>	m	Soil	Prope	ntion		<u> </u>
Jau										am]	}	<u>noc</u>				1
and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fect	Soil/Rock Description And Geologic Origin For Each Major Unit			USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1	24 16	2 2 1 2		0 - 6' FILL, WELL-GRADED GRAVEL: GW foundary sand, brown to black, dry, with slag brick fragments.	and		,			0						2 in. Spli Spoon a 140 lb Hammer
255	24 12	1 1 2 2	-2	-		,	(FILL) GW			0					· .	
3 35	24 18	1 2 2 3	-4 	4' -4.3' wood debris.			1		۰.	0. 0						
4 55	24 20	55 88 8		5.3' wet. 6 - 16.5' POORLY-GRADED SAND: SP, gr brown (2.5Y 5/2), mostly sand [mostly fine], v	ayish wet.	 1				0						
5 55	24 16	3 5 7 8								0.						
6 55	24 17	6 16 12 14					.SP			0						
ľ		14 14					-32			o				 		
7 35	24 17	6 11 16 18	-13							0		    . 				
8 55 X	24 20	7 11 13 14				1				0						

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	Template: SOII	BORING - Project: NORTH PLANT.GPJ



				Boring Number SB212							Pag	ge 2	of	2
San	npie		<u> </u>		1			ď		Soil	Prope			
Number and Type	t & (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 20	13 18 24 18	16	6 - 16.5' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [ mostly fine], wet. (continued) 16' - 16.5' coarsens downward to become a well graded sand. 16.5 - 17.5' WELL-GRADED SAND: SW, mostly sand [some fine, some medium, some coarse].	SP SW			0 0 0						
10 SS	24 16	8 11 15 21	- 18 - 19	17.5 - 25' POORLY-GRADED SAND: SP, mostly sand [sand], laminations. 18' -25' no laminations, homogenous.				0					-	
11 SS	24 20	8 8 14 18	E-20 E-21 E-21		SP.			0 0						
12 SS	24. 24	9 11 14 17	-22 -23					0 0						
13 SS	.24 16	18 24 26 20	24 	24.8' 50.8 mm diamter rock fragments. 25 - 26' LEAN CLAY: CL, very dark gray (10YR	CL			0 0						
			-26	3/1), trace sand. 26' End of Boring,				0	· ·		-			
		. '												
								· · .					-	
•			}							ļ				



TECHNOLOGY

	/Projec			lant Removal	License/	Peimit/I	Monitoin	ngNi	unber		Boring	Numbe SB2			•••••
				f crew chief (first, last) and Firm	Date Dri	lling St	arted	<u> </u>	(Da	te Drilli				Drill	ing Method
Joel	Martin	Ļ				-					-	-		1	llow stem
Test	Servi	ce Co	orporat				/2012				5/27/2	012			ger
				Common Well Name	Final Sta				Surfac	e Elevat		201	Bo		Diameter inches
.ocal (	Grid Or	gin	🛛 (es	timated: 🛛 ) or Boring Location 📋			AVD)	]		Local G	NAV			0.5	mones
State I		54.		N, E S/C/ $\otimes$	La	.t	<u> </u>	· .				Ø N	r		×Е
	1/4	of	f	/4 of Section , T N, R	Lon		• • •		"		649 Fe			32119	Feet 🗌 W
acility	D			County	State		Civil To		-	Village					,
			i	Lake	L	<u> </u>	Wauk	egan		· · · · · · ·					γ <b></b>
San				· · ·	• •		ľ		PID 10.6 eV Lamp		Sou	Prope	erties		4
	Length Att. & Recovered (in)	tts	eet	Soil/Rock Description					< L <	S G	ł				
r g	t Att	Cour	lnF	And Geologic Origin For		S	9	ą	).6 e	essi th (t	it fe	1	ity		ents
number and Type	ngt Cov	Blow Counts	Depth In Feet	Each Major Unit		sc	Graphic Log	Well Diagram		Compressive Strength (1sf)	Moisture Content	Liquid	Plasticity Index	200	RQD/ Comments
	122	10	å			Þ	0 3	<u>Þ ñ</u>		<u>5</u>	<u>Ž č</u>	111	IL II	Ч	
1 ;s	24 4	- 6 6		0 - 2' FILL, WELL-GRADED GRAVEL: Gi appears to be road bedding, white, poor rec	/v, overy.		0.0°.		}	·	}	}			2 in. Split Spoon and
-  X		6	-1		-	(FILL) GW	6 B		0		}	1			140 lb Hammer
M		•	E,			1	0.		{·		{				-
2 \$\$	12	5 4	-2	2 - 6' FILL, WELL-GRADED SAND: SW, I	prown to				0	1					
$^{\circ}$	8	4 2 3	<b>E</b> 3	black, some slag and some brick fragments no visual impacts.	, 10 0007,						Ì	ļ	1		1
			Ē					•	0					1	
3 SS ∏	24	1	-4			(FILL) SW			0		ļ		]	1	}
ss∦	18	1	E_5									ļ	}	} .	1
M			Ē	5' wet.					0		}			<b>.</b> .	}
A	24		E-6	6 - 7.5' POORLY-GRADED SAND: SP, g	navieb				0		ł	}	} .	}	ļ
4 55 ∖∖	24 19	1 5 7	E	brown (2.5Y 5/2), mostly sand (mostly fine								1 .	}	}	
X		/	E7			SP			0	}			{		
			E-8	7.5 - 12' WELL-GRADED SAND: SW, gra	yish	1					{		1	1	[
5 \$S∬	24 17	5 10 12 14	Ē	brown (2.5Y 5/2), mostly sand [some fine, medium, some coarse].	some				0	1	{			1	At approxima
		14	E-9			{			0		1			1	8 start
			E								}	<b>\</b>			adding mu while drillin
6	24	6	E-10			sw			0		}	{	1		to keep sand from
6 55∦	18	10 13 16	-11						ł		} `	}			clogging
: M			E			}			0		}	}			augers.
7	24	6	-12	12 - 16' POORLY-GRADED SAND: SP, 9	ravieh				0	}	ł	}	}		
ss∬	18	6 10 13 16	È	brown (2.5Y 5/2), mostly sand [mostly fine	], .	1			·  *	}		}		ł	
- {X		10	-13	homogenous.		1			0	{	1	}	1	.	
$\square$			E-14			SP			1	1		1	}		
8 55 🕅	24 20	9 12 15 17	È.			1			0				} .	1	
W		17	F-15		,							· ·			1

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TECHNOLOGY Boring Number SB213 of 2 Page 2 Sample Soil Properties PID 10.6 eV Lamp Length Att. & Recovered (in) Soil/Rock Description Compressive Strength (tsf) Depth In Feet Blow Counts RQD/ Comments And Geologic Origin For Number and Type Moisture Content Liquid Limit Log Well Diagram USCS Plasticity Graphic Each Major Unit Index P 200 0 ŞΡ 16 - 18' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2), mostly sand [some fine, some medium, some coarse]. 9 SS 0 24 8 11 16 16 19 SW 0 -18 18 - 24' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine], homogenous, trace gravel [mostly fine]. 10 24 8 11 14 17 Ł 0 SS 20 E - 19 0 E-20 11 24 11 3 13 10 0 SS 22 -21 SP 0 -22 12 SS 24 2 6 8 18 0 12 -23 0 -24 13 SS 16 30 24 22 Ē clay on bottom foot of augers 24 24 - 26' No Recovery. 0 0 E 25 0 -26 14 SS 24 20 18 18 30 26 - 28' LEAN CLAY: CL, dark gray (10YR 4/1), 0 6 trace sand. -27 CL -28 28' End of Boring.



-	у/Ргојес			· · · ·	License	Permit	Monitor	nng Nu	inber	i	Boring	Nunbe			······
				lant Removal								SB2			
		•	Name o	f crew chief (first, last) and Firm	Date D	rilling St	arted		Dat	e Drilli	ng Con	npleted		1	ing Method
	Martir t Servi		Irnora	tion		6176	/2012				6/26/2	012			llow sten
162			прота	Conunon Well Nam	e  Final S	tatic Wat			Surface	Elevat		.012	Bo		ge <b>r</b> Diameter
					1	Feet (N					(NAV	D)			inches
ocal	Grid Or	igin	🛛 (es	stimated: 🔀 ) or Boring Location 🗌	1	<u>`</u>	0	,		Local C					
state	Plane			N, E s/c/ℕ	I I	.at						🛛 N		·	×Ε
	1/4	of	1	/4 of Section , T N, R	J Lo		0	1 	" 		632 Fe	et⊡ S	42	32213	Feet 🗌 V
acility	y ID			County	State		Civil To		ty/ or V	llage			•		
<u> </u>			,	Lake	IL		Wauk	tegan			0.1	<u>_</u>			
San	nple								daa		Sou	Prope	erties		
	ઝ (E	uts	eet	Soil/Rock Description		1			ГГ <	s E	1				
be 7	Att	Jour	ln F	And Geologic Origin For		S	0	a	.e e	lh (t	년 고		LT .		RQD/ Comments
and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Each Major Unit		sc	Graphic Log	Well Diagram	PID 10.6 eV Lamp	npr	Moisture Content	Liquid	Plasticity Index	200	<u>a</u>
and			Del	· · · · · · · · · · · · · · · · · · ·		n s	Grap Log	Well Diag	H _A	Compressive Strength (1sf)	$\frac{10}{C}$	Liquid	Plastic Index	P 21	RQD/ Comm
s∬	24 6	5 8 505	E	0 - 5.5' FILL, POORLY-GRADED SAND SILT: SP-SM, some silt, dry, brown sand a					1						2 in. Split Spoon an
- IV		300	E-1	with bricks.							}	]			140 lb
$\mathbb{N}$			Ē						0	.*					[Hammer. [0-2'
: H	24	17	<u>-</u> 2						0			ł			PP-0ppm
s₩	14	17 19 13 15	Ē.			(FILL) SP-SM				]	}	]	]		)
- IA		.0	[3 ⊑			96-91v			0						
			-4			1			· ·					2	1
3 is ∏	24 14	17 12 13 20	E						0			1			
Ĩ	14	20	-5			1			}		9				
Α			Ē	5.5 - 11' POORLY-GRADED SAND: SP	black		₽ m		66.1						
4 E	24	1	F-6	(10YR 2/1), moist to wet, trace roots and g	ravel, oil										
ŝ	12	1 5 6	Ē	wetted, strong MGP-like odor. 5.5'-6.0' NA weathered, malleable, viscous.	APL IS				•				Į		1
Ā			<u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u>	6'-10' oil coated, NAPL is fluid, wet at 6'.					166				1		
Ľ	.		Ē8					1		i i	1		ĺ	ſ	1
5 IS	24 16	4 6 7 9	Ê			SP									
Ĭ		9	Ę9						93				·		
ΠĮ			- - ·						35		1.	•			·
6	24	4	F 10	10' -11' oil coasted, trace emulsified NAPI	_ (2mm).				248	ł	ł	1		}	
s∥	20	4 6 9 9	E				3 4			1				ļ	
M			-11	11 - 14' POORLY-GRADED SAND: SP					85.5						
μ.		-	E 12	brown (2.5Y 5/2), trace gravel [mostly fin strong MGP-like odor.	ej, sneen,									1	
s	24 17	7 15 15 17	Ē			SP			98.3						
Ĩ		17	- 13						30.3		·				
			E					1	0.3						
в	24	7	E 14	14 - 14.5' WELL-GRADED SAND: SW,					5	1 1	l				1
s∦	20	7 9 11 15	E 15	brown (2.5Y 5/2), mostly sand [trace fine	, mostly	∫ ^{sw}		1	33.1						
- <u>-</u> -	1		<u> </u>	prmation on this form is true and correct to the			<u>[· · · ·</u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>	L	L.,	1

Signature	Firm Natural Resource Technology, Inc. 23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Tel: 262.523.9000 Fax: 262.523.9001
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NATURAL Resource Technolo

			TEC	HNOLOGY										
				Boring Number SB214	1	<del></del>	<u>.</u>	·	<u></u>			ge 2	of	2
Sar	nple							PID 10.6 eV Lamp	<u> </u>	Soil	Prope	erties		
	tt. & d (in)	unts	Feet	Soil/Rock Description And Geologic Origin For		1		٥VI	sive (Isf)	'				Ŋ
ber Lype	th A vere	ő	u lu	Each Major Unit	CS	hic	ram.	10.6	press gth (	ture	L E	icity		/ ment
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet		U S C	Graphic Log	Well Diagram	Ð	Compressive Strength (tsf)	Moisture Content	Limit	Plasticity Index	P 200	RQD/ Comments
Ň			-	medium, trace coarse], sheen, MGP-like odor.	<del></del>			17.3						
<u> </u>	24	5	-16	14.5 - 28' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine],				8.9						
9 SS	24 24	5 12 13 16	-	homogeneous, trace sheen. (continued)				0.0					-	
ΙΛ			-17 -		· ·			5.3						Î.
10	24	6	-18	18' no sheen, no odor.				1.7						
ss	16	6 10 15 16	E 											
- IA						. 7		0.8						
11	24	14 21	E-20	20' no sheen, becomes very poorly graded all fine				1.5						
ŝŝ	18	14 21 23 25	E1	sand, thinly laminated.		1.1							•	
$\square$					SP			0.5						
12 SS	24	14 21 23 26	-22					1.6						
55	17	23 26	23					1						
- M			E .					1						
13 SS	24 18	9 14 19 13	-24	24' homogeneous, less poorly graded, trace medium and coarse.				0.7						
		13	- 25					0.9					•	
$\square$		•	E-26											
14 - SS	24 9	12 22 24 20												
X		20	-27 E					1.2						
[]	24	•	-28									[		001 201 - 4 5
15 SS	24 21	9 10 12 10	E	28 - 30' LEAN CLAY: CL, dark gray (10YR 4/1), trace sand [mostly fine].										28'-30' >4.5 tsf
M		10			CL		]							compressive strength.
Ľ			-30	30' End of Boring.								[		
		۰.										]		
				··· ··								ĺ		
									•					
			ŀ	· ·							.  .			
														}
													·	
				30' End of Boring.	1						.			
				-										



					,								Pag		of	2
	y/Projec			lio	Lic	cense/Pe	nnivi	vionitoi	un <u>g N</u> u	imber		Boring	Numbe SB2			
				lant Removal of crew chief (first, last) and Firm	Da	te Drilli	ng St	arted		Da	te Drillin				Dell	ing Method
-	Martii			· · · · · · · · · · · · · · · · · · ·												llow stem
	t Servi		orpora					/2012				5/28/2	012		au	lger
				Common Well Name	Fin	nal Static				Surfac	Elevat			Bo		Diameter
Local	Grid Or	inin	🕅 (e	stimated: 🛛 ) or Boring Location 📋		Fee	et (N.	AVD)			Feet ( Local C	NAV			8.3	inches
	Plane	igni	<b>M</b> (c	N, E S/C/N		Lat .		°	· 	"	LUCAIC	1110 L.O.	N 🛛	· ·	•	⊠Е
	1/4	of	1	1/4 of Section , T N, R		Long.		o 	, 		4691	620 Fe			32156	Feet 🗌 W
Facilit	y lD		<u>-</u>	County	State			Civil To		-	/illage					
				Lake	IL			Wauk	egan		· .			-		<del></del>
Sar	nple									din		Soil	Prope	rties		-
	જ ઊ	ts	ist	Soil/Rock Description						PID 10.6 eV Lamp	୍ କ୍ କ୍					
ь ре	Att.	Joun	In Fe	And Geologic Origin For			ŝ		 	.e e	essiv h (ts	2 -		ţ		sots
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fect	Each Major Unit			sci	Graphic Log	Well Diagram	10	Compressive Strength (tsf)	Moisture Content	Liquid	Plasticity Index	8	RQD/ Comments
	_		Del				5	53	Well Diagr	IId	Str	ΫÖ	Liquic	Plastic Index	P 200	
1 SS	24 18	4 16 16 12	E	0 - 0.2' FILL: (FILL), Crushed Stone. 0.2 - 1' FILL, ORGANIC SOIL WITH GRA		/1	FILL) FILL)			!	1					2 in. Split Spoon and
		12	Εı	ן (OL/OH)g.	AVEL.		(FILL) L/OH)			0				ļ		140 lb
$\sim$		•	E	1-6' FILL, WELL-GRADED SAND: SW,				1. 1.		ľ						Hammer.
2	24	3	$\mathbb{E}^2$	(10YR 2/1), mostly sand [mostly medium], slag and cinders.	, ary, w					0		].	ļ			
ss	22	3 6 5 3	-3			Í				ł	Ì					
1/			Ē				FILL)			0						
_		,	F-4	3.5' gravel sized fragments with glassy luster-(coal?).			SW					1				
ss	24 11	3 3 2 2	F						· ·	0				ļ		4'-6' PID 0 ppm
X		2	-5	5' -6'sand is mostly coarse, wet at 5'.			•		[	0						2
. 1	V		E,													
4	24	2 2 1 2	F-6	6 - 8' POORLY-GRADED SAND: SP, gra	ayish				1		1	1				
ss	13	1 2	E7	brown (2.5Y 5/2), mostly sand [mostly me trace roots.	aiumj,	'	SP		ł							
ſ	Ν.		Ē	· · ·			37		ł						ļ	
5	24	2	-8	8 - 11.5' WELL-GRADED SAND: SW, mo	ostly					0						
ss	13	2 1 1 12	Ē	sand [some medium, some coarse], trace g	gravel,	.										
1			<u>-9</u>	very dark gray (10YR 4/1) to black (10YR 2	<i>9</i> 1).								.		!	
L			E 10	]			SW					]			}	ļ
6 SS	24 14	3 3 2 3	=							0	1					
		3	-11	11' sheen and MGP-like odor.					1							
ſ	$\mathbf{V}$		E	11.5 - 14' WELL-GRADED SAND: SW, g						0						
7 SS	24	3	E 12	brown (2.5Y 5/2), mostly sand [mostly me	dium],				1	2.7	1	1	Ì			
ss	12	3 2 3 5	E 12	stained black 20%, oil coated, MGP-like od	. <b>.</b>		sw	1953	1							
			- 13				<b></b>		1					1		
Ļ			E - 14					<u>[]</u>	1	10-	}		.]			
8 SS	24	3 4 4	F	14 - 24' POORLY-GRADED SAND: SP, coated, NAPL is fluid, MGP-like odor.	sneen,	I, OH	SP		1	10.5						
	Y	4	<u>F-15</u>					· • * / ·	<u> </u>		<u></u>		1			
I here	by certi	fy that	the inf	ormation on this form is true and correct to the	best of	f my kn	owled	ige.								

Signature SA	• Fin	<ul> <li>Matural Resource Technology, Inc.</li> <li>23713 W. Paul Road, Suite D, Pewaukee, WI 53072</li> </ul>	Tel: 262.523.9000 Fax: 262.523.9001
		Template: SOII	BORING - Project: NORTH PLANT.GPJ



				Boring Number SB215							Pag	ge 2	of	2
Sar	nple							amp		Soil	Prope	rties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 55	24 13	3 3 5 5	16 17	<ul> <li>14 - 24' POORLY-GRADED SAND: SP, sheen, oil coated, NAPL is fluid, MGP-like odor. (continued)</li> <li>16' oil wetted, strong MGP-like odor 16'-24', oil is fluid, sand is stained 100% black.</li> </ul>				210						
10 SS	24 18	3 - 4 5 7	-18 	18' -22' free phase oil, in top of sampler. Oil wetted sample (18'-20'), NAPL is fluid to viscous, makes sand tacky from 18'-20'.	SP			115 283						
11 SS	24 21	8 8 13 15	-20 -21		. ' ,			245 178		-				,
12 SS	24 17	7 11 29 15	-22	22' oil wetted.				328 29				1		•
13 SS	24 18	4 9 12 16	-24	24 - 26' LEAN CLAY: CL, dark gray (10YR 4/1), trace gravel [mostly fine], no odors, no visual impacts, no apparent tar in fractures.	CL			154 0 0						>4.5 tsf compressive strength
Ľ			-26	26' End of Boring.	`	<u> </u>			· .					
													·	
		-				-								
							-				]			



$\begin{array}{c c c c c c c c c c c c c c c c c c c $														<u>e 1</u>	of	2
Boring Drilled By: Name of crew chief (first, lasp) and Frunt foet Martin Test Service Corporation     Date Drilling Satesd     Date Drilling Completed     Date Drilling Satesd       Local Grid Origin Test Service Corporation     Conunon Well Name     First Satesder Name     N     Satesder Name       Local Grid Origin Test Service Corporation     N     B SC 05     [1at	-	-			lant Removal	License/	Permit	Monitor	ung Nu	inber						-
Test Service Corporation         7/3/2012         auger           Commen Well Name         Final Static Water Lawel         Surface Elevation         Berehold Similar Key         Berehold Similar						Date Dri	illing St	arted		Dat	e Drilli				Drill	ing Method
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						}.									ho	llow stem
Feet (NAVD)Feet (NAVD)8.3 inchesLocal Grid Origin(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)(3)	_Test	Servi	ce Co	orporat		- D: 10.			<del>.</del>				012			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $					Common Well Name	•			1	Surface			ות	130		
I/4 of       I/4 of Section       T       N, R       Log       I/4 of       4691613 Feel S       432129 Feel W         Pecify ID       Courty       State       Courty Wilkegen       State       Courty Wilkegen       State       Soil Properties       30         Sample       II       Soil Rock Description       And Geologio Origin For       III       IIII       IIIII State       Soil Properties         IIII State       IIIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Local (	Jrid Or	gin	🛛 (es	stimated: 🛛 ) or Boring Location 🗍	 )		-	ł							
Table I/4 of Exetton       Lake       Lang       County       State       County of Values         Sample       County       Lake       IL       Wattkegan       Soil Properties       Soil Properties         Sample       Sample       Sample       Soil Rect Description       Acd Geologio Origin For       Soil Rect Description       Soil Rect Description <t< td=""><td>State I</td><td>Plane</td><td></td><td></td><td>N, E $S/C/N$</td><td>, La</td><td>nt</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>×Ε</td></t<>	State I	Plane			N, E $S/C/N$	, La	nt									×Ε
Sample subjectLakeILWaukeganSample subjectSoil/Rock Description And Geologic Origin For Each Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ Back Major Unit $a_{11}^{0}$ 	<del>- 1</del>		of	1			<u>e</u>	<u></u>			4691	613 Fe	et S	43	32129	Feet 🗌 W
Sample     Soil/Rock Description       age of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of the point of th	Facility	nD.			· · · · · · · · · · · · · · · · · · ·					ty/ or V	/illage					
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1     24     2     -4     0     -4     2     -4     2     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4			ا ب		Soil/Pock Description		1	[ ]		Lam		1				{
1     24     2     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4 <td< td=""><td></td><td>d (ir</td><td>unts</td><td>Feet</td><td>_</td><td></td><td></td><td>]</td><td></td><td>2</td><td>sive (tsf)</td><td>ļ</td><td>ļ</td><td></td><td>l</td><td>ß</td></td<>		d (ir	unts	Feet	_			]		2	sive (tsf)	ļ	ļ		l	ß
1     24     2     -4     0     -4     2     -4     2     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4     -4	ber Vpe	th A vere	õ	h In			S S	hic	uram	10.6	pres.	ture	2 -	icity		/ men
12420-4 FILL POORLY-GRADED SAND: SP, dry, with trace gravel, trace brick and cinder debris, derk brown, dy.02 in Split. Sp0 and 140 lb Hammer.215 $\frac{2}{3}$ storn2-4-4-8 POORLY-GRADED SAND: SP, trace gravel, with little slag and brick, Strong MGP-like odor.02 in Split. SP324 $\frac{2}{3}$ to-4-4 -8' POORLY-GRADED SAND: SP, trace gravel, with little slag and brick, Strong MGP-like odor.004-8' POORLY-GRADED SAND: SP, trace gravel, with little slag and brick, Strong MGP-like odor.005-5' -6' blueish-black, wet at 5.5'. 6' sheen, wet, MGP-like odor.5P34.15241-7-88 - 10' No Recovery.5241-7-7-76242-1010 - 24 POORLY-GRADED SAND: SP, mostly 	und.	Leng Reco	Blow	Cept			S	Grap	Vell Diag	Ð	Com	Cont	nbi ili	Plast	20(	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	111	24			0 - 4' FILL, POORLY-GRADED SAND: SF	P, dry,				<u></u>			1			2 in. Split
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	ss	18	22			is, dark						l	1	1.		
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	-> H	15	3	-2	2'-4' black dry to moist MGP-like odor		(FILL) SP			74 1	1	}				Refusal on
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	ssχ	12	3 50(37)	E_					}							slag brick at
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ц			-3			ł				}	}	1			through to
SS20 $\frac{1}{1}$ $\frac{1}{-5}$ with little slag and brick, Strong MGP-like odor.107.2424wrr $-6$ 5.5'-6' blueish-black, wet at 5.5'. 6' sheen, wet, MGP-like odor.SP34.148 $\frac{1}{1}$ $-7$ $-7$ $-7$ 524 $\frac{1}{1}$ $-7$ $-8$ $8 - 10'$ No Recovery.524 $\frac{1}{1}$ $-9$ $-7$ $-8$ 624 $\frac{wort}{1}$ $-9$ $-10$ $10 - 24'$ POORLY-GRADED SAND: SP, mostly send [mostly fine], sheen, wet, stained black, oil-wetted, with trace weather NAPL (yellow), sheen, strong MGP-like odor. $98.1$ 724 $\frac{2}{10}$ $-12$ $12' - 14'$ sheen at spoon lop (may be draw down). $5P$ 724 $\frac{2}{10}$ $-11$ $14' - 16'$ faint MGP-like odor. $23.4$	. –		2	4			<u> </u>		ł		{	ł	ļ	}		4ft.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	ss M		21	F	4 - 8 POORLY-GRADED SAND: SP, trace with little slag and brick, Strong MGP-like od	e gravei, or.	ł		1		}	{	ł	}		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	X		1	E-5			}		1	107.2	2	ł	{	1		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				Ē	5.5' -6' blueish-black, wet at 5.5'.		}				1			ļ	} .	approximatel
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	4		1	E	6' sheen, wet, MGP-like odor.		SP			34.1		{	ł	1	}	adding mud
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\mathbb{N}$			E.			} · .					}			ł	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5		1	F-8	8 - 10' No Recovery		·	1.0.1.2	4					{	{	
624 $\frac{24}{\text{work}}$ 10 - 24 POORLY-GRADED SAND: SP, mostry sand [mostly fine], sheen, wet, stained black, oil-wetted, with trace weather NAPL(yellow), sheen, strong MGP-like odor.98.17242-117242197-129-13-139-13-1415 $\frac{10}{19}$ -1415 $\frac{10}{19}$ -141414'-16' faint MGP-like odor.23.4	SS	0	1	Ē-9			ĺ	{	{	.			-	{	1	
624 $\frac{24}{\text{work}}$ 10 - 24 POORLY-GRADED SAND: SP, mostry sand [mostly fine], sheen, wet, stained black, oil-wetted, with trace weather NAPL(yellow), sheen, strong MGP-like odor.98.17242-117242197-129-13-139-13-1415 $\frac{10}{19}$ -1415 $\frac{10}{19}$ -141414'-16' faint MGP-like odor.23.4			,	Ē			<b>.</b>	{	ļ			Ì		}	Ì	1
SS $17$ work $17$ work $1$ $17$ work $1$ $11$ $11$ $11$ $11$ $11$ $11$ $11$	6 H	24	WOH	-10	10-24 POORLY-GRADED SAND: SP. m	nostly		1.20		98.1		ł		{	} .	}
7 7 SS 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12	ss∦		WOH WOH 1	Ē.	sand [mostly fine], sheen, wet, stained black	- -	1		]	1		Į			{	1
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8         24         5         -14         14'-16' faint MGP-like odor.         48.4           8         55         15         16         -14         23.4	śs∭		57	E	1 12 - 14 Sheen at spoon top (may be draw o	owny.	SP		1		1	1		}		1
8 M 24 J F 14 - To faint MGP-like odor.	. IXI		9	E13				137	1	48.4	1	1		}		}
8 M 24 J F 14 - To faint MGP-like odor.	$\square$			E-14					1		1		}	1		
			5 13 16	Ę	14'-16' faint MGP-like odor.		1			23.4	{		]	1 .		ţ
	N		20	-15	<u> </u>		1		1					} .		<u> </u>

Signature Town H Clone	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
<u> </u>	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
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Template: SOIL BORING - Project: NORTH PLANT.GPJ



				HNOLOGY Boring Number SB216				•			Pag	ge [:] 2	of .	2
Sar	mple		1					dau		Soil	Prope	rties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 22	5 9 11 13	-16	10 - 24' POORLY-GRADED SAND: SP, mostly sand [mostly fine], sheen, wet, stained black, oil-wetted, with trace weather NAPL(yellow), sheen, strong MGP-like odor. (continued) 16' - 18' faint MGP-like odor.				_23 39.9						
10 SS	24 18	1 5 12 14	-18	18' -20' faint MGP-like odor.				36.4 45.7						
11 SS	24 22	5 11 16 17	-20 -21	20' -22' oil wetted, NAPL sheen, and trace weathered NAPL, wet, strong MGP-like odor.	SP		~	47.2 72.9						
12 SS	24 23	11 17 19 19	-22 -23	22' -24' Some silt (20-30%), oil-coated grains, little free NAPL, weathered, wet, strong MGP-like odor.			- -	1293 409		,				
-13 	24 17	10 12 15 15	-24	24 - 26' LEAN CLAY: CL, grayish brown (2.5Y 5/2), trace sand [mostly coarse], trace gravel [mostly fine], Residual NAPL sludge at sand/clay contact, black staining with weathered NAPL in	CL			1208 309			1) 2)	-	1	
, <u> </u>		• 	-26	fractures near contact (Strong MGP-like odor PID 309 ppm) and faint MGP-like odor in lower portion of clay (PID 25 ppm). 26' End of Boring.	 			25						
				3				,						
,													•	



			TEC	HNOLOGY					·						
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Facility	-			lant Removal	License/	Permul	Monitor	ing Nu	mber	'		Number SB2			
				f crew chief (first, last) and Firm	Date Dr	illing St	arted		Dat	e Drillir				Drill	ing Method
-	Martir	-							1		.6 00	piecea			llow stem
	t Servi		orpora	tion		6/27	/2012			(	5/27/2	2012			ger
	· .			Common Well Name	Final St			1 19	Surface	Elevat			Bo		Diameter
	<u></u>				F	eet (N	AVD)			Feet (				8.3	inches
Local State	Grid Or Plane	ıgın	⊠ (es	stimated: $\boxtimes$ ) or Boring Location $\square$ N, E S/C/N		at	0	•		Local G	nd Loo				
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Facilit		· ·			State		Civil To	wn/Ci	ty/ or \		<u>14 I 0</u>			52082	
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San	nple			]	<u> </u>	Ţ			đ		Soil	Prope	erties		].
	· · · · · · · · · · · · · · · · · · ·		÷	Soil/Rock Description					PID 10.6 eV Lamp		[		1		1
0	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	And Geologic Origin For	-	1			ev	Compressive Strength (tsf)				1	Lt 1
Lyper Typer	th A	ő	h In	Each Major Unit		CS	hic	uan.	10.6	pres	sture	म छ	x		
Number and Type	eng Secc	3lov	Cept			ns	Graphic Log	Well Diagram	a	Control 1	Moisture Content	Liquid	Plasticity Index	P 200	RQD/ Comments
1 1	24		E 7	1 0 - 0.2' FILL, TOPSOIL: (OL/OH)g, black (1	0YR	(FILL)		<u> </u>	0		~ 0				2 in. Split
ss∦	22	2 4 5 5		12/1), topsoil. 0.2 - 4' FILL, POORLY-GRADED SAND: S	<u> </u>	(PLOH)			ĺ			[	{	1	Spoon and 140 lb
IA			E	brown to black, with slag and brick fragments		ľ			0	1.				ł	Hammer.
		e	E-2			(FILL) SP				Į				ļ	
$\frac{2}{ss}$	24 14	6 3 2 2	Ē			SP			0				Ì		
X		2	<u>-</u> 3						0	ſ			1		
l IV		÷	E.									ļ			
3 SS	24	3 5 7	E ⁴	3.8' wet. 4 - 6.5' POORLY-GRADED SAND: SP, gr	/	·†	1.3		0	1			1	i i	
ss	14	7	E-5	brown (2.5Y 5/2), mostly sand [mostly fine],	, 10	· ·					[	-			
			Ē	visual impacts.		SP			0		[				ĺ
4	24	5	<u>–</u> 6					}	0	ł				1	
ss∦	16	5 8 9 10	Ę	6.5 - 7.5' WELL-GRADED SAND: SW, mo	stlv		1		ļ			}			
IX.		10	Ē7	sand [mostly medium].	<b>,</b>	sw			1		ļ				· · ·
ľ			Ē.	7.5 - 8.5' POORLY-GRADED SAND: SP,	grayish		1375	[			ĺ	1		Í	
5 SS	24 16	6 6 5 4	-8	brown (2.5Y 5/2), mostly sand [mostly fine]		SP		1	0		}	{	}	· ·	}
- 35 W		5	E.g	8.5 - 9.5' WELL-GRADED SAND: SW, mo sand (mostly coarse).	stly	sw						}	1	1	
A			F		ravich	011			0					1	
вF	24	11		9.5 - 12' POORLY-GRADED SAND: SP, g brown (2.5Y 5/2), mostly sand [mostly med	ium].			1	0				ſ	1	
6 SS	17	11 12 13 12	Ê			}.		1			1		ł		
- IĂ		12		]		SP			0		}	]		ļ	
Ľ	<u> </u>		E-12					1	]			1			
7 SS	24 18	6 11 11 16	E	12 - 15' WELL-GRADED SAND: SW, mos sand [some fine, some medium, some coars		1		1	0		ĺ	1	[	1	1
		16	E-13	rounded gravel [mostly fine].				1	0	1	1	{		{	1
/\						sw			"		]	ļ			}
8	24	6	E-14						0		1				1
ss X	17	6 9 13 14	E 15						1		1		Í		
	L	L_,		J				<u> </u>	1	<u>ــــــ</u>	<u> </u>	<u> </u>	1	1	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	R 11	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
	Detter	23713 W. Paul Road, Suite D, Pewaukee, WI 5307	2 Fax: 262.523.9001
		Template: So	DIL BORING - Project: NORTH PLANT.GPJ



	· ·			Boring Number SB217	_						Pag	ge 2	of	2
San	1ple	-					-	dur		Soil	Prope	erties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagrain	PID 10.6 eV Lanp	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 ss	24 16	12 17 22 20	16	15 - 19' POORLY-GRADED SAND: SP, gravish brown (2.5Y 5/2), mostly sand [mostly fine].	SP			0						
10 SS	24 19	11 12 11 16	- 18	19 - 19.5' WELL-GRADED SAND: SW, mostly	sw			0 0						
- 11 SS	24 4	9 9 10 11	20	Sand [some fine, some medium, some coarse]. 19.5 - 22' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine].	SP			o					-	
12 SS	24 20	5 7 8 8	22	22 - 24' LEAN CLAY: CL, dark gray (10YR 4/1), few gravel [mostly].	CL									>4.5 tsf
			-24	24' End of Boring.	-			0 _,						strength
i														
•							2				•			
								}			•		•	
		•												
													 ! 	
					-			     		-				
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	I	•	r -	·	I	1	I	I	I i		I	1 1	I	



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-	y/Projec				License/I	ermit/l	Monitor	ung Nu	mber	ĺ	Boning				
				lant Removal f crew chief (first, last) and Firm	Date Dri	ling St	arted		Dat	e Drilli		SB2			ing Method
-	Martin	-	vanie o			ung 36	anton .				ig con	ipieleu			llow stem
	t Servi		orporat	tion		7/2/	2012				7/2/2	012			ger
				Common Well Name	Final Sta	tic Wat	er Leve	1 8	Surface	Elevat	ion		Bo	rehole	Diameter
					Fe	æt (N.	AVD)				NAV			8.3	inches
	Grid Or	igin	🛛 (es	stimated: (X) or Boring Location	Ia	t	0	r	n	Local C	rid Lo				
State I		c.		N, E S/C/®	1		- <u>-</u>	•	11			N			
Facilit	1/4 ·	of	1	/4 of Section , T N, R	Long State		Civil To	wn/Cit	<u></u>		591 Fe		43	52104	Feet 🗌 W
. aonn	,				IL.	·	Wauk		<i></i>						
San	mple		• •			ł			ę.	<u> </u>	Soil	Prope	erties		<u> </u>
	· ·····			Soil/Rock Description		1			PID 10.6 eV Lam			[^			† .
	di G	unts	Fee	And Geologic Origin For			•		2°	sive (tsf)					. 23
ype	vere Vere	Ŝ	Ч	Each Major Unit		cs	hic .	am	0.6	gth	b trie		city	_	men
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet			U S C	Graphic Log	Vell	A	Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	200	RQD/ Comments
	<u>⊢</u> ≊ 24			0 - 0.5' FILL, SILTY SAND: SM, poorly grad	fed.	(FILL)	Ш	N H		08	20			Р_	2 in. Split
ss∥	16	2 3 3	Ē,	\brown, dry.	[	<u>('SM'</u>						[	i i		Spoon and 140 lb
.   <u> </u>		•		0.5 - 6' FILL, WELL-GRADED SAND: SW, and black, 25-50% Cinders, dry,	brown				0.5						Hammer.
			<u>-2</u>				4, NA			.		1			
ss SS	24 12	3 3 2 2		·		1			0						
	"	ž	-3			(FILL)				ļ	}				
$\wedge$			-			`sw′			•						
3	24 22	2	-4						0						
3 SS ↓	22	2 1 2 2	Ē								ļ				
۱Å		÷	-5 -	5' wet, some brick debris, greater than 50%	cinders.	1									
			-6			ļ				}	1				
ss V	24 14	2355	Ē	6 - 23.9 POORLY-GRADED SAND: SP, n sand [some fine, some medium], stained gra	nostly v/biack,				1.3		ļ				At approximately
- IX		5	-7	wet, MGP-lke odor.		ł		1							6' start
- M	1		È			ĺ		{		{ ·	1	1	{	ĺ	adding mud while drilling
5	24	1	<u>–</u> 8						56.9					1	to keep sand from
ss∦	24	1 5 7 7	<u>–</u> 9			}				1				). 	clogging
A			Ę		•			4				1			augers.
Ļ		6	E 10	101 111 shaan		ļ	2/2	4	100 7					]	
6 SS	24 18	6 11 11 15		10' -11' sheen. 10.4' -10.5 oil wetted, trace NAPL.		SP		•	100.2						
X		15	-11					1	30.2						
1			Ē									1		·	
7 SS∬	24 16	5 9 11 13	- 12	12' stained gray/black sand, faint MGP-like	odor.	· ·	1	ļ	7						
55	16	11 13	E 13			1	. 7	ļ	_				}		
۱A			Ē				1.	1	0			1			
۰F	24	7	- 14				37	1	0				}		
ss	19	7 11 12 15	È			1	1	ĺ	[		[	1	1		1
יע		15	- 15	<u> </u>			1	1	1		<u>                                     </u>				

Signature Town of Clause	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
· 0 -	23713 W. Paul Road, Suite D, Pewaukec, WI 53072	Fax: 262.523.9001
	TI-t COH	BOBBIG B ' + MODELLATION

Template: SOIL BORING - Project: NORTH PLANT.GPJ



**TECHNOLOGY** Boring Number SB218 Page 2 of 2 Sample Soil Properties PID 10.6 cV Lamp Length Att. & Recovered (in) Soil/Rock Description Compressive Strength (tsf) Blow Counts Depth In Feet RQD/ Comments And Geologic Origin For Moisture Content Plasticity Index Number and Type USCS Graphic Log Well Diagram Liquid Each Major Unit P 200 6 - 23.9' POORLY-GRADED SAND: SP, mostly sand [some fine, some medium], stained gray/black, wet, MGP-lke odor. *(continued)* 16' wet, faint MGP-like odor, trace gravel [mostly 0.2 -16 F 9 SS 24 23 9 12 26 24 0 fine]. 17 1 2 -18 24 21 0 10 12 17 18 18 SS 19 . 0 SP -20 24 20 11 SS 9 14 16 15 0 -21 0 22 12 24 8 18 12 12 0 SS 11 23 23.9 - 26' LEAN CLAY: to SILT: CL, trace gravel [mostly fine], wet, grayish brown (2.5Y 5/2) to gray (2.5Y 5/1), no odor, (Till). 24 7 11 13 15 24 22 13 0 SS 25 CL 0 26 26' End of Boring.

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		_		HNOLOGY	·			• .				Pag		of	2
	y/Projec mer NS			lant Removal	License	Permit/	Monitor	ing Nui	nber			Numbe SB2			
	_			f crew chief (first, last) and Firm	Date D	rilling St	arted		Dat	e Drillis		ipleted		Drill	ing Method
	Martir					<i>c</i> <b>n n</b>									llow stem
Tes	t Servi	ce Ca	orpora	tion Common Well Name	  Final S	6/27	/2012		( Jurface	Elevat	5/27/2	2012	Bo		ger Diameter
					)	Feet (N				Feet (	NAV				inches
	Grid Or	igin	🛛 (es	stimated: 🔯 ) or Boring Location 📋	 Г т	at	0	• · · ·		Local G	rid Lo				
State	Plane 1/4	of	1	N, E S/C/®		ng	0	, .		46014	77 Fa	N ⊠ et⊟ S			⊠ E Feet □ W
Facilit		01			State	<u>ng</u>	Civil To	own/Cit	y/ or \	village				2080	
·				Lake	IL		Wauk	egan							
Sar	nple		ļ			1			quue		Soil	Prope	erties		
	Length Att. & Recovered (in)	nts	eet	Soil/Rock Description					PID 10.6 eV Lamp	lvc sf)		ļ		1	
ype	h At /ered	Counts	l al 1	And Geologic Origin For Each Major Unit		s l	g	una di	0.6	gth (	ure nt		city	_	nent
Number and Type	Length Att. Recovered	Blow	Depth In Fect			u.s.c	Graphic Log	Well Diagram	<u> </u>	Compressive Strength (tsf)	Aoist Conte	Liquid	Plasticity Index	P 200	RQD/ Comments
1	24	2 2 1		0 - 0.3' FILL, TOPSOIL: OL/OH, Topsoil.			Y . Y		0	0 0	40		<u>H</u> H	<u> </u>	2 in. Split
ss	20	1 2		0.3 - 6' FILL, WELL-GRADED SAND: SW brown to black sand with slag brick fragment					-	ļ				:	Spoon and 140 lb
M			Ē	cinders.					0				}		Hammer.
2 SS	24	1							0						
ss	6	1	<b>-</b> 3			(FILL) SW			·	{			1		
$\sim$			Ē			sw					ł				
3 55	24 12	1	<b>4</b>						0			1			
35	12	1	E-5	5' wet. 5'-6' sulfur like odor.							}	{	ļ		
· //						ł					}	}	· .		
4 SS	24 20	5 8 9	E ⁻⁶	6 - 6.2' PEAT (AMORPHOUS): PT, black ( \2/1), peat with sulfur-like odor.	(10YR		1.11.2		0	[	Į	Į	1		{
	20	9	<u>-</u> 7	6.2 - 8' POORLY-GRADED SAND: SP, gr	ayish	J SP			0	]		ł	ľ		
1	V		Ę,	brown (2.5Y 5/2), wet, 6.2-6.5 mottled 10% of with roots.	orange				·				}	Ì	
5 SS	24 15	6 9 10 10	1-8 E	8 - 12.5' WELL-GRADED SAND: SW, very gray (2.5Y 3/1), mostly sand [some fine, so	/ dark				0	1		1	{		}
		10	<u>-</u> 9	medium, some coarse], wet.					0		•				
V	V		E ₁₀						-					}	
6 SS	24 17	9 11 20 22	Ē			sw			0	1				1	1
		22	-11	· · · · · · · · · · · · · · · · · · ·					0				}		
Ľ	¥.		F - 12										ł		
7 SS	24 20	9 12 22 20		12.5 - 18' POORLY-GRADED SAND: SP,	gravieb				0		Į		1	· ·	
l)	ł	20	E 13	brown (2.5Y 5/2), mostly sand [mostly fine]	, wet.				0			ł	ł		
Ļ	۱ <u>.</u>		E 	•		SP			- -		ļ	}			
ss 🖉	24 17	15 20 20 23	E						0	1	Į			ļ	
γ	<u>}</u>	25	-15	<u></u>		]		1		I	L	1	<u> </u>		<u> </u>

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 7	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
1 A STATE	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
· · · · · · · · · · · · · · · · · · ·	Template: SOE	L BORING - Project: NORTH PLANT.GPJ



				HNOLOGY										
			·	Boring Number SB219			, <u> </u>					ge 2	of	2
San	mple		l i	0-1101-D-	{			PID 10.6 eV Lamp		Soil	Prope	arties		
	Length Att. & Recovered (in)	stur	Depth In Feet	Soil/Rock Description And Geologic Origin For	Į			¢۷	Compressive Strength (tsf)		ļ	{		ra 1
ber ſype	th A vere	Č	h In	Each Major Unit	SO	hic	ram	10.6	press ugth (	ture	ц <u>а</u> т	icity 2	_	/ ment
Number and Type	Leng Reco	Blow Counts	Dept	Ĩ.	USC	Graphic Log	Well Diagram	ð	Com	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
M				12.5 - 18 POORLY-GRADED SAND: SP, gravish brown (2.5Y 5/2), mostly sand [mostly fine], wet.	<u> </u>	1.1		0						
۹.	24	8	E-16	(continued)				0						
9 55	24 20	8 11 17 17		_	SP			U						
M			-17 -					0					-	
10	24	10	-18	18 - 19.7' WELL-GRADED SAND: SW, grayish	[			0			ļ			
ss∦	20	10 10 13 17		brown (2.5Y 5/2), mostly sand [mostly medium].				U						
IA I			-19 E		SW		.	0.						
- 11	24	11	-20	19.7 - 21.5' POORLY-GRADED SAND: SP, mostly sand [mostly fine].		1.17		0						>4.5 tsf
11 SS	16	11 14 23 9	E 21	and most met.	SP			J						compressive strength
A				$\sim$ 21.3' -21.5' coarse gravel, no visual impacts. $\sim$										Suchgan
Ľ			-22	21.5 - 22' LEAN CLAY: CL, dark gray (2.5Y 5/2), trace sand [mostly coarse].	<u>_ CL</u>	<u> </u>								
				22' End of Boring.										
							1							
				·		1								
														· ·
	ı )					}			,		]			
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Facilit Four				lant Removal	License/I	'ennīt/l	Monitoi	nīg Nu	mber-			Nunba SB22			
				f crew chief (first, last) and Firm	Date Dri	lling St	arted		Dat	e Drilli				Drill	ing Method
	Martin								1						llow stem
Tes	t Servi	<u>ce Co</u>	orporat	Common Well Name	Final Sta		/2012	<del></del>		Elevat	5/28/2	.012	10-		ger Diameter
				Continon wen Name			AVD)		Suilact		NAV	ות	.		inches
Local	Grid Or	igin	🛛 (es	stimated: 🛛 ) or Boring Location 📋	1 1		0	ł.		Local G				0.5	mones
State	Plane			N, E $S/C/N$	La	t				ι		M N	I.		Ε
	1/4	of	1	/4 of Section , T N, R	l Lon		<u>•</u>	' 			576 Fe	et S	43	2147	Feet 🗌 W
Facilit	уЮ				State IL		Civil To		ty/ or \	fillage					
Sam	nple			Lake	ш. 	I	Wauk	legan	<u>n</u> .		Soil	Prope	ortion		
Jal				9-30- 1 S		1		[	PID 10.6 eV Lamp			<u>r rope</u>			{
	Length Att. & Recovered (in)	nts	Feet	Soil/Rock Description			1.		٩V	Compressive Strength (tsf)			{		5
Number and Type	Length Att. Recovered (	Blow Counts	Depth In Feet	And Geologic Origin For		N I	Fi	an	0.6	sth (	rt di		Plasticity Index		RQD/ Comments
Imul I	engt	low	epth	Each Major Unit		SC	Graphic Log	Well Diagram	<u>a</u>	treng	Moisture Content	Liquid	lasti udex	200	DO DE
	고 교 24	11		0 - 1.5' FILL, WELL-GRADED SAND: SW,	mostly		01	≯ A	<u> </u>	03		<u>Li Li</u>	H L	£√	2 in. Split
ss∦	20	5 5 9	E	sand (mostly fine), little gravel (mostly fine),	dry,	(FILL) SW					ļ	ł			Spoon and
Ň		3		brown, no visual impacts.		SW	1.174		o			]		1	140 lb Hammer.
Ľ			E_2	1.5 - 3' FILL, WELL-GRADED SAND: SW, with cinders and slag.	dry,	(FILL)					}	ł			ł
2 SS	24 12	2 4 4	Ęĩ.	with cinders and stag.		SW			0			}.			
		2	-3	3 - 5' FILL: (FILL), moist, red brick, faint MG	P-like		0+0+0		13.2		1	ĺ			
(Y			Ē	odor.		{	0+0+0+0 0+0+0		.0.2			}	1		
3	24	1	<b>-4</b>			(FILL)	01010	1	0.9					[	
ss	14	1 1 2	E_5	4.5' wet.		ļ	01010					1			
. I∖				5 - 6' FILL, WELL-GRADED SAND: SW, b (10YR 2/1), mostly sand [some fine, some r	lack nedium,	(FILL)								]	
4	24	4	<u>–</u> 6	some coarse], wet, few cinders, few slag, die	sel-like /			ţ	1.2		1	1		1	
ss	17	4 6 8	Ē	odor. 6 - 10' POORLY-GRADED SAND: SP, gra	yish			}	]	{		}			
Į,			<u>–</u> 7	brown (2.5Y 5/2), mostly sand [mostly fine],				]	0.1	Į	]	1.	}		
			F-8			SP		]		}			}		
5 SS	24 16	4 6 8	Ę			58		]	0	}		ł	ł	}.	
X		8	<u>F</u> 9			1		]	0	}			}		
· · //	V		ŧ					]	Ĭ		}	1	1		
6 SS	24	2 4	E10	10 - 15.5' WELL-GRADED SAND: SW, mc	stly	1			0	}	{		1	[	1
55	17	4 9 11	EII	sand [some fine, some medium], dark gray ( 4/1).	אזטו	{				<b>.</b>	{	{			1
			Ē	11' -12' trace sheen in water.		1			0	1	1	1			1
7	24	9	E-12	12' -13'no sheen.		1		1	0.8	1.	1	1			1.
ss	18	9 10 12 13	F.,			sw									
			-13	13' -15.5' faint diesel-like odor, color change	to				1	1.		}			
· · ·			-14	grayish brown (2.5 5/2).							1 .	}	}		
ss)	24 20	9 16 18 18	r						0.1		}	}.	}.		
·	1	18	-15	<u> </u>		<u>}</u>	4-253	1		<u> </u>	1	1			

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
· · · · · · · · · · · · · · · · · · ·	Template: SOII	BORING - Project: NORTH PLANT.GPJ



			TEC	HNOLOGY					•					
	mala	r		Boring Number SB220		· · · · · · · · · · · · · · · · · · ·			r	Soil	Pag Prope		of	2.
Number and Type	Length Att. & d	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram		Compressive Strength (tsf)			Ai	P 200	RQD/ Conunents
9 SS	24 16	17 7 7 14	- 16 - 17	15.5 - 25' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine], faint dieset-like odor.				0.1	,					
10 SS	24 19	5 9 13 17	- 18 - 19 - 19	18' sand becomes dark gray, no odors.				0 0 0						
11 SS	24 21	9 11 13 16	-20 -21	20' sand becomes grayish brown, no sheen and no odor.	SP			0						
12 SS	24 21	13 17 14 17	-22 -23	22' very poorly graded sand, mostly sand [mostly fine].				0 0						
13 SS	24 24	9 13 13 17	-24	24.9' fine gravel. 25 - 26' LEAN CLAY: CL, dark gray (10YR 4/1),	, CL			0						>4.5 tsf
Ľ			-26	trace sand [mostly fine], trace gravel [mostly fine], dry. 26' End of boring.										strength
		-								-				
		1												



Facilit	Facility/Project Name					License/Permit/Monitoring Number						Page 1 of 2				
				lant Removai	LICCIIS		wionino.	ung ivu	moer	ľ		SB2				
				f crew chief (first, last) and Firm	Date D	rilling St	arted		Dat	e Drilli				Drill	ing Method	
	Martii t Servi		orporat	tion		7/2/	2012				7/2/2	012			llow stem ger	
			<u> </u>	Common Well Name	Final S	tatic Wat			Surface	Elevat			Bo		Diameter	
<del></del>	<u>a :</u>			· · · · · · · · · · · · · · · · · · ·						Feet (				8.3 inches		
Local State	Grid Or Plane	າgາກ		stimated: ⊠) or Boring Location □ N, E S/C/Ŵ	Lat''					Local G	•	1			ΣE	
Facilit	1/4	of	1	/4 of Section , T N, R	Lc State	ng	CulT	own/Ci			577 Fe	et S	<u> </u>	32174	Feet 🗌 W	
raum	уш			Lake	IL.		Waul		ty/ot v	mage						
San	nple					¹		But	B		Soil	Prop	erties			
	<u> </u>	S	te l	Soil/Rock Description					/ Lan	90	· · · · ·	1				
- 9	Att. red (	puno	n Fe	And Geologic Origin For		N I			6 e l	sssiv i (ts			2		nts	
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Each Major Unit		Ú S C S	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid	Plasticity Index	P 200	RQD/ Comments	
	1 <u>1</u> 24 24	4 3 3 2	<u> </u>	0 - 1' FILL, POORLY-GRADED SAND Wi SW-SM; mostly sand [mostly fine], some si	TH SILT	(FILL)	5- III	Г	- <del>14</del>		20			<u> </u>	2 in. Split	
33	- 4	3 2	-1	brown.		SW-SN	1.11		0						Spoon and 140 lb	
M			È.	1 - 3' FILL, POORLY-GRADED SAND: SI sand [mostly fine], dry, grayish-black very fir				1.						Į	Hammer.	
ss V	24 20	13 11 8 6	-2 -	with cinders.		(FILL) SP			0							
55	20	8 6	-3	3 - 4' FILL, WELL-GRADED SAND: SW, t	Jack				3.1		1.	1				
N				(10YR 2/1), dry, cinders and well graded sar	nd slag,	(FILL) , SW			3.1					ļ		
3	24	4 8 6 4	-4	trace brick debris, black ,dry, faint MGP-like 4 - 6' POORLY-GRADED GRAVEL WITH		/ <del> </del>	0									
ss	12	6 4	Ē-5	(GP)s, black (10YR 2/1), mostly gravel [mc fine], wet, Cinders and slag, at 4' oil wetted,	stly	(GP)s	0.0									
[]			Ē	MGP-like odor, well graded sand, sheen.	12111	(GF)5			6							
. 4	24	1 WOH	E-6	6 - 25' POORLY-GRADED SAND: SP, bla		-			20.8							
ss∦	10	1	E.7	(10YR 2/1), mostly sand [mostly fine], wet, MGP-liked odor, sheen.										]		
N									51.6		1					
5	24	5	- 8	8' -10' stained black, wet with multiple layer					56.9				].			
່ss∦	18	5 6 10	E,	sheens (yellow and gray), no visible free N/ MGP-like odor.	APL,											
A			Ę.						206.9							
6	24	5	F 10	10' -12' with sheens and zones of weathere	d NAPL									,		
ss	18	8 5 6	E - 11	sheen (zones of brown stained sand), less s at approximately 11.5'.		SP					1			· ·		
M			Ē					1	370.9							
7	24	4	- 12	11.5' -12' sand is now grayish brown (2.5Y sheen.					110.1				1	İ	PID .	
ss	18	4 7 12 14	È.	12' -14' NAPL sheen with layers of weather sheen, MGP-like odor, wet.	ed NAPL	·		]							measurement	
Ιλ			E ¹³						59.6						bag: 320.3	
8 1	24	5	E 14	14' -16' NAPL sheen become less concentr	alodwith		30	, a'	26.7						ppm	
ဒီန	18	9 10 16	È.	depth. fine sand grayish brown, wet, MGP-li		'			20.7							
<u> </u>	<u> </u>		<u>  15</u>					1	<u> </u>	<u> </u>		1		ļ	<u> </u>	
I herel Signat	-	-		Firm Na					¥							
orginal	مرار بالمد	7-	J	110	tural Re 13 W. Pa					WI 530			2.523.9 2.523.9			
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			, ILC	HNOLOGY Boring Number SB221							Pag	e 2	of	2
Sar	nple				1	1		dui		Soil	Prope			
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fcet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagraun		Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 24	9 9 14 13	16	6 - 25' POORLY-GRADED SAND: SP, black (10YR 2/1), mostly sand [mostly fine], wet, MGP-liked odor, sheen. (continued) 16' -18' becoming more fine grained, no sheen at spoon bottom, grayish-brown, wet.	-			14.6 22.1 23.4						Each spoon following has some weathered NAPL in slough return at top of spoon
10 SS	24 24	4 9 14 15	-18	18' -20 slight sheen at top half of spoon (likely drag down), bottorn half-no sheen, faint MGP-like odor, wet.				28.5 3.1						
11 SS	24 24	5 9 12 21	20	20' -22' sand fining with depth, becoming dark grayish brown, faint MGP-like odor at spoon bottom, wet, no sheen.	ŚP			1.4 1.2						
12 SS	24 24	10 15 18 18	22	22' -24' faint MGP-like odor (sheen very slight, likely drag down).				9.6 8.6						
13 SS	24 24	15 13 16 13	-24	25 - 26' LEAN CLAY: CL, little gravel [mostly				3.6 0.3						
			-26	_ pyrite), gray to dark gray, wet. 26' End of Boring.	CL									
										· · · · · · · · · · · · · · · · · · ·				

.



Technology of 2 Page 1 Facility/Project Name License/Permit/Monitoring Number Boring Number Former NSG North Plant Removal SB222 Boring Drilled By: Name of crew chief (first, last) and Firm Date Drilling Started Date Drilling Completed Drilling Method Joe Martin hollow stem 6/26/2012 Test Service Corporation 6/26/2012 auger Common Well Name Final Static Water Level Surface Elevation Borehole Diameter Feet (NAVD) Feet (NAVD) 8.3 inches Local Grid Origin 🔯 (estimated: 🔯 ) or Boring Location Local Grid Location 0 State Plane N. E Lat S/C/N N 🖾 ⊠е 0 Long 4691585 Feet S 432208 Feet 🗋 W 1/4 of 1/4 of Section Т N, R Facility ID Civil Town/City/ or Village State County Lake L Waukegan Sample Lamp Soil Properties Soil/Rock Description ઝ (ਜ In Feet Blow Counts (tsf) PID 10.6 eV Length Att. . Recovered (: Compressive Strength (tsf And Geologic Origin For Comments Number and Type Moisture Content Diagram S Plasticit Graphic Depth ] Each Major Unit Liquid SC P 200 RQD/ Index Well ʻ Boʻj Б (FILL) 0 - 0.3' FILL, SILT: ML, light gray, (gypsum?). 0.3 - 4' FILL, WELL-GRADED SAND: SW, mostly 1 24 0 2 in. Split ML SS 14 Spoon and 140 lb sand [some fine, some medium, some coarse], moist 0 Hammer. to wet, brown to black, with cinders and slag. (FILL) -7 2 24 811 1.4 SW ss 8 -3 4 - 6' POORLY-GRADED SAND: SP, black (2.5Y 3 24 11.6 3434 2.5/1), mostly sand [mostly fine], wet, sulfur-like odor, very dark gray to black. SS 16 5 SP -6 6 - 7' WELL-GRADED SAND: SW, black (2.5Y 24 4 8 10 10 2.9 4 2.5/1), mostly sand [some fine, some medium, some coarse], sulfur-like odor. SS 17 SW 7 4.6 7 - 13' POORLY-GRADED SAND: SP, black (2.5Y 2.5/1), mostly sand [mostly fine], wet, sulfur-like odor, very dark gray to black. 8 24 5 24 4 6 10 12 SS 15 9 0.7 10 SP 5 8 11 11 10' sulfur-like odor, sand is starting to turn grayish 6 24 2.2 SS 20 brown. 11 1.3 12 5 12 13 16 7 24 1 SS 17 13 13 - 18' WELL-GRADED SAND: SW, black (2.5Y 1.4 2.5/1), sulfur-like odor. 0.6 14 SW 7111210 2.1 8 24 SS 20 I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 7	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
Ast - x	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
	Templeter SOII	DODING Designer NODTH DI ANTE ODI

Template: SOIL BORING - Project: NORTH PLANT.GPJ



TECHNOLOGY SB222 2 of 2 Boring Number Page Sample Soil Properties PID 10.6 eV Lamp Length Att. & Recovered (in) Soil/Rock Description Compressive Strength (tsf) Blow Counts Depth In Fcet And Geologic Origin For RQD/ -Comments Number and Type Moisture Content Plasticity Index USCS Diagram Graphic Liquid Limit Each Major Unit P 200 Well Log 13 - 18 WELL-GRADED SAND: SW, black (2.5Y 0.2 2.5/1), sulfur-like odor. (continued) -16 9 SS 0.7 24 47 12 17 16 SW 0.6 E -18 18 - 23.5' POORLY-GRADED SAND: SP, black (2.5Y 2.5/1), mostly sand [mostly fine], faint 10 SS 3.8 24 8 16 14 15 8 12 14 14 E - 19 18 sulfur-like odor. 11 SS 24 20 2.4 E-20 SP E-21 3 -22 12 SS 24 18 8 12 27 18 2.3 -23 2.1 23.3' -23.5' large angular gravel fragments. 23.5 - 24' LEAN CLAY: CL, dark gray (2.5Y 4/1). CL. -24 13 SS 24 24 6 7 10 20 0 24' End of Boring.



Facility					License/Permit/Monitoring Number					Page 1 of 2						
Faciny/Project Name Former NSG North Plant Removal					Lice	ense/Per	muvi	Monitoi	ing Ni	mber	ł	Bônng				
				ant Removal f crew chief (first, last) and Firm	Det	e Drillir	n~ \$t/	und .			te Drilli		SB2		Deit	ing Method
-	Martir	-	Vallie O	t crew ciller (mst, last) and r fmi	Date		ng on	aleu		Da	le Dinn	ng Con	ipieleu			llow stem
Test	Servi	t ce Ca	morat	ion		6	5/29/	2012		ĺ	(	5/29/2	2012			ger
			<u> </u>	Common Well Name	- Fina	al Static				Surfac	e Elevat					Diameter
						Feet	t (N	AVD)				NAV			8.3	inches
	Grid Or	igin	🛛 (es	timated: 🛛 ) or Boring Location 🔲	1	T at		0	,	"	Local C	irid Loo			_	
State I				N, E S/C/(N)		Lat.		 0	1				N			×Ε
Facility	1/4	of	1	/4 of Section , T N, R	State	Long_		Civil To		tul or V		522 Fe	et_IS	4	32087	Feet 🗌 W
racing	μ			Lake	IL		1	Wauk		-	mage					
San			)		<u> </u>			Tau	.vgun	1	r	Soil	Prope			<u></u>
	- A			Coll/Dode Departmention						PID 10.6 eV Lamp			· · ·	1100	1	1
	Length Att. & Recovered (in)	nts	Depth In Feet	Soil/Rock Description							tsf)	Moisturc Content	l	ł		
r S	a At crec	Cou	[n]	And Geologic Origin For			S	. <u>ല</u>	E	0.6	ress (th (	ar fi		, T	ļ	icut
Number and Type	ngt	Blow Counts	pth	Each Major Unit			SC	Graphic Log	Well Diagram		lung	oist	Liquid	Plasticity Index	200	RQD/ Conuncats
	ы Ч Ц		å				<u>P</u>	53	≱ä	14	<u>5 2</u>	Σŭ	<u> </u>	<u> </u>	<u> </u>	<u> </u>
ss M	24 12	3 3 3	E I	0 - 6 FILL, WELL-GRADED SAND: SW, with bricks and slag.	brown,	'			ſ	ļ .					{	{
X		3	-1	· · · · ·					İ	0		Į		ł		}
$\sim 10^{-10}$										ľ			ļ	}		]
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ss	8	4 2 2 2	F,	· · · ·		ła	FILL)		· .		1.		i 			1
A				· · ·			sw	1		0.1						
_ Ц		_	E_4									]		}		
3 SS	24 6	2 3 3 3		4' poor recovery, brick fragments and fine	gravel.	· [				0		1		1	,	
		3	-5	5' wet.						{	].	1	{	Ì		
A			E .								}		ļ	1	1	
4	24	2	<b>F</b> 6	6 - 6.8' POORLY-GRADED SAND: SP, I	mottled				j	0	}			}		
ss∦	18	2 4 6		black 30%,.			SP			l l						
-	·.			6.8 - 16.8' WELL-GRADED SAND: SW, ( (10YR 4/1), mostly sand [some fine, some	dark gra e mediu	ay ∣ ⊥m. ∣				0			1			
$\square$				some coarse].		· }			ł	}			}			
5 SS	24 15	6 7 12 10	Ē	8' -10' grayish brown (2.5Y 5/2).						0	] ·		, ·			
		10	-9							0						
$\wedge$											l .			1	1	1
6 🖯	24	6	<u> </u>							0					}	
6 SS ↓	16	10 17 18	Ē.								<u> </u>	) ·		ļ		
- IV		-					SW			0		1				
$\square$			E 12								1	ł	l	1	1 .	
ss ∏	24 20	6 9 12 13	È "	12'-14' grayish brown (2.5Y 5/2).						0		1		1	}	} ·
~~ }	20	13	-13			ļ			1	0		]			ļ	•
$\mathbb{N}$												1				
8	24	6	-14			ł			1.	0		{	{	1		
ss X	16	6 9 10 10	Ē	• •		}				ľ	}	ł	}	1		
33 M			-15					10.10	4	1	1	1	1	1	1	1

Signature Trung H Claus	Firm Natural Resource Technology, Inc.	Tel: 262.523.9000
. 0 -	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
	Template: SOII	BORING - Project: NORTH PLANT.GPJ



			TEC	HNOLOGY Boring Number SB223							Dag		~ <b>f</b>	<b>ว</b> .
	nple			Boring Number BD223			[	B	1	Soil	Pag Prope		of	2
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)		Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 16	2 8 15 15	16	16.8 - 21' POORLY-GRADED SAND: SP, mostly sand [mostly fine], trace gravel [mostly fine],	sw			0 0 0						
10 SS	24 24	8 10 12 15	18 	brownish gray (2.5Y 5/2).	SP			0						
11 SS	24	4 16 20 12	-20		CL			0 0	-			-		length recovered not recorded. >4.5 tsf
			-22	22' End of Boring.										compressive strength
• *		,		2										
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Facility/Project Name Former NSG North Plant Removal						nse/Permit	/Mon	utom	ig Nu	mber		Page 1 of 2 Boring Number					
				ant Removal								2	SB2	24			
-		-	Name o	f crew chief (first, last) and Firm	Date	Drilling S	tarted	1		Da	te Drilli	ng Con	npleted		1	ing Method	
Joe N Test S	/lartir Servi	ı ce Co	orporat	ion	1	6/28	3/20	12	·			5/28/2	2012			ollow stem	
				Common Well Name	Final	Static Wa	ater L	evel	5	Surfac	e Elevat			Bc	rehole	Diameter	
		<del> </del>		· · · · · · · · · · · · · · · · · · ·		Feet (N	ĮAV	D)			Feet				8.3 inches		
Local G State P		ıgın	🛛 (es	timated: $\boxtimes$ ) or Boring Location $\square$ N, E S/C/N	Lat ""				Local Grid Location					M. r.			
0.00021	1/4	of	I	/4 of Section , T N, R	,	Long	•	1		"	4691	519 Fe			32111	⊠ E Fcet □ W	
Facility				County	tate					у/ от \	/illage						
					۳.		Wa	uke	gan					1			
Sam	ole									dun		Soil	Prop	erties		-	
	E &	ıls	ect	Soil/Rock Description						PID 10.6 eV Lamp	်းကို	ļ					
H P	Length Att. & Recovered (in)	Counts	Depth In Fect	And Geologic Origin For		S	0		a	.6 e	Compressive Strength (tsf)	e te		Ę.		RQD/ Comments	
Number and Type	ngt Sv	Blow (	ЦI	Each Major Unit		· US	Graphic	ыĘ	wen Diagram	010	engl	Moisture Content	Liquid	Plasticity Index	200		
			<u>ă</u>			5	5	Log	<u>ה</u> א		S S	<u>ž                                    </u>	ĒĒ	L P	<u>ц</u>		
ss∭	24 21	9 11	Ē	0 - 3' FILL, LEAN CLAY: to SILT: CL, dry.		1	E	2		0		Í		1		2 in. Split Spoon and	
Ă		. 11	E-1			(EU)	F	2		0						140 lb Hammer.	
Ш			-2			(FILL CL	1	2									
2 SS	24 16	6 8 7 8						2		0	ĺ	( ·	[		.		
		8	-3	3 - 5.5' FILL, WELL-GRADED SAND: SW,	drv to					0.3		1		1			
M	1		Ę.	moist, black sand with cinders and slag, no oc	dor, n	o				0.0							
3 SS∭	24	228	-4	visual impacts. 4' -5.5' MGP-like odor.		(FILL SW	)			10.1	.				ļ		
ss M	22	2 8	E_5										.		l		
$\mathbb{N}$				5.5 - 8.5' FILL, SILT: ML, organic fibers, brow	un sili	· 		iii ii		87.1			· ·				
4	24	2	-6	poor recovery-wet MGP-like odor, stained bla	ck	·,				07.1	Í		Ì		[	{	
ss	8	2 1 2 3		100%.		(FiLL	,				1.	ļ					
A			E' 1			Г ML			•	168							
5 H	24	2	-8	7.5' -8.5' lots of woody debris and solvent-like	e odo	r.				6	•	[	1				
ss∭	18	2 3 5		8.5 - 16' POORLY-GRADED SAND: SP, da	ark gra	ay	Щ	뷌									
١٨		Ū	<u>-</u> 9	(10YR 4/1), wet, no odor, no visual impact.	_					5.2							
Ц			E10			1					{			1		[	
6 SS	24 22	3 4 7 9								1		ļ				1.	
.  X		9	-11	·													
$\square$			E			SP			·					· ·			
7 ss ∬	24 19	6 9 11 11	⊢12 E							0.9				1			
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ss X	24	4 9	-14	· · ·						0.7							
ssM	18	4 9 17 21	-15					2						]			
I hereby	v certif	y that		emation on this form is true and correct to the be	stofr	ny knowle	dge.	_ /		·	1	<u> </u>	<u> </u>	_ <u>L</u> ,	J		
Signatu		.7				Resource		hnol	000	Inc			Fel: 26	2.523.9	000		
	/*	÷∕⇒=	=#=	11444		Paul Road				ukee,		72 F	ax: 26	2.523.9	001		
_										Te	mplate: S	SOIL B	ORING	- Projec	NOR	TH PLANT.GF	



				Boring Number SB224							Pag	ge 2	of	2
Sai	nple							da		Soil	Prop	erties		
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Fect	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram		Compressive Strength (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
9 SS	24 24	10 11 15 14	16	8.5 - 16' POORLY-GRADED SAND: SP, dark gray (10YR 4/1), wet, no odor, no visual impact. (continued) 16 - 20' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2), mostly sand [some fine, some medium, some coarse], trace gravel [mostly fine].	SP			0.5 0 0.6						
10 \$S	. 24 20	6 9 11 13	18		sw			0 0.4						
11 SS 12	24 18 24	7 13 22 22 22	21	20 - 24' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine].	SP		· · ·	0	• ;					
12 SS 13 SS	18 24 23	7 9 16 40 10 16 20 25	23	23.9' -24' fine gravel, large rock fragments in shoe.				0						
	23	20 25	-25	26' End of Boring.	CL					1				>4.5 tsf compressive strength
	-	·												
<b>.</b> .														
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				lant Removal								SB2			
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	Martin			•		<i>cinc</i>	/2012				5/26/2	012		1	llow sten
Test	Servi		nporat	Common Well Name	Final Sta			ī 1	Surface	Elevat		.012	Bo		ger Diameter
	-				Fe	eet (N	ÁVD)			Feet	NAV	D)	}		inches
	Grid Ori	gin	🛛 (cs	timated: () or Boring Location	Lat'					" Local Grid Location					
tate ]	Plane	1		N, E S/C/(10)	)		 0	 1				N			🖾 E
cilit	1/4	of	l	/4 of Section , T N, R	Long State		Civil To		ty/ or V		532 Fe	et S	. 43	2178	Feet 🗋 V
icint _j	μ			Lake	IL .		Wauk		Ly OI Y	inage					
San	ple		<u> </u>			11	J	- Sull	<u> </u>	,	Soil	Prope	erties		l
				Soil/Rock Description		1	}		Laur						4
	d (ii) &	unts	Feel	And Geologic Origin For					S	sive (tsf)		ł			5
and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Each Major Unit		Cs	hic	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)	Moisture Content	P +	Plasticity Index	_	RQD/ Comments
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	low	)ept			U S (	Graphic Log	Vell	A	tren (	Moisture Content	Limit	Plastic Index	200	
1 ] /	24	2		0-3' FILL, POORLY-GRADED SAND: S	P, and				0		20			<u> </u>	2 in. Split
s₩	18	5	Ę,	gypsum, previous logs identified it as wall b found some fragments could be wall board,	oard,	ł									Spoon ar 140 lb
- [[]			E	slag, brick, dry, mostly gypsum.		(FILL) SP	1.		0	{		1	{ 1		Hammer.
ĿЦ	24	5	E-2			SP			0		]	ļ			
2 s	24 16	6 5 3										1		i	1
IX		3	<u>-</u> 3	3 - 5' FILL, WELL-GRADED SAND: SW,					1.7	}	Į				1
$\mathbb{P}$			E,	brown, with slag, dry, no odor, no visual imp	oacts.	(FILL) SW					ł		ł		1.
3 [  s []	24 9	2222	Ē	4' wet.		sw			0		1		}		1
Ĭ		ź	-5	5 - 6.8' POORLY-GRADED SAND: SP, n	nostly.			ļ			}		Į		ļ
$\mathbb{N}$				sand [mostly fine], with roots, MGP-like odo	r, oil	ł		1			}				
4	24	4	E-6	coated. 6' oil wetted, MGP-like odor.		SP		[	7.2	{	1				{
s∦	19	4 5 5 7	E-7	6.8 - 8' POORLY-GRADED SAND; SP, g	ravish	.							1		
- 14	}		Ę'	brown (2.5Y 5/2), mostly sand [mostly fine]	],	SP		1	12.7			{	]		1
5	24	4	E-8	MGP-like odor. 8 - 12.5' WELL-GRADED SAND: SW, gra	wich				0,1		ļ	{			
s∥	12	4 5 7 7	E	brown (2.5Y 5/2), mostly sand [some fine,	some						}	}		}	
١X		<i>'</i> .	E9	medium, some coarse], no odor, no visual i	mpcats.				}	}		ł			
Ľ			E-10			1				1		}			1
6 	· 24 18	3	Ē	10' trace fine gravel.		sw			0		}			1	
Ĩ		4 4	-11						0.1		{	1	{	1	
A			E								ļ	}	}		
7	24	5 7	-12						0.1		{	1	ł	1	
s	20	5 7 9	-13	12.5 - 24' POORLY-GRADED SAND: SP	, grayish	,			0	1	{	1	1		1
- IA				brown (2.5Y 5/2), mostly sand [mostly fine	ŀ	ŀ.	57		0	-	}				
a L	24	8	-14			SP		1	0.8	}	}	}	}		
ŝ	20	11 13 16	Ē		• • •			4		1	{	1		}	}
			-15	L		1	1	1	<u> </u>	)	L	1	1	}	1

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Signature //	Firm	Natural Resource Technology, Inc.	Tel: 262.523.9000
- Destrenze		23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001

Template: SOIL BORING - Project: NORTH PLANT.GPJ



Resource Technology Boring Number SB225 Page 2 of 2 Soil Properties Sample PID 10.6 eV Lamp Length Att. & Recovered (in) Soil/Rock Description Compressive Strength (tsf) Depth In Feet Blow Counts RQD/ Comments And Geologic Origin For Number and Type Moisture Content Plasticity Index Graphic Log Well Diagram USCS Each Major Unit Liquid P 200 12.5 - 24' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine]. (continued) 16' -18' trace fine gravel (16'-18'). -16 9 SS Q 24 6 8 12 16 18 -17 0 -18 10 SS 24 22 10 13 12 14 0 E - 19 0 SP -20 12 13 22 20 20' becoming more poorly graded (all fine sand). 11 24 0,3 SS 19 -21 0.2 ·22 8 12 50(47) 12 24 0 ŝŜ 14 -23 0 -24 23.9' -24' rock chips in the shoe. 13 SS 24 17 10 12 16 19 0 24 - 26' LEAN CLAY: CL, dark gray (10YR 4/1), trace sand [mostly medium]. ·25 CL. >4.5 tsf 0 compressive strength -26 26' End of Boring. 0



			ICC	HNOLOGY						•		Pag	ge 1	of	2
Facilit				lant Removal	License/	Pennut/	Monitor	ing Ni	mber			Number SB2			
				forew chief (first, last) and Firm	Date Dri	Illing St	tarted		Dat	e Drilli		apleted		किंग	ing Method
-	Martii	•		rerew ener (mai, ias) and I mit	Date Di	ining of				o orun		apieteu		1	llow stem
			orporat	tion		6/29	/2012			(	5/29/2	2012			ger
<del></del> ,			_ <u>*</u>	Common Well Name	Final Sta			1	Surface	Elevat	ion		Bo	rehole	Diameter
<u> </u>					F	eet (N	AVD)			Feet (				8.3	inches
	Grid Or	igin	🛛 (es	stimated: 🔯 ) or Boring Location 🗌			0			Local C	irid Lo	•			
State	· •			N, E s/c/®			 0		·····						_ ⊠ E
Facilit	1/4 v ID	of		/4 of Section , T N, R County	Lon State	<u>g</u>	Civil To	wn/Ci	tv/ or \		495 Fe	et⊡ S	4	32124	Feet 🗌 W
i aonit.	<i>y</i> 11 <i>2</i>			Lake	IL		Wauk								
San	aple		[]			'		Bun	9		Soil	Prope	erties		
	<u>, ^ </u>			Soil/Rock Description		-			PID 10.6 eV Lamp			Î			1
	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	And Geologic Origin For					5	Compressive Strength (tsf)		1	[		∽ si
ype	Length Att. Recovered (	Ğ	H	Each Major Unit		S	.g	E E	0,6	gth (	ure nt		city		RQD/ Comments
Number and Type	sngt	NO	epth			S C	Graphic Log	Well Diagram	Ā	omp	Moisture Content	Liquid Limit	Plasticity Index	P 200	DO UNI
<u>2</u> a 1 1	고 교 24	<u></u>		0 - 1' FILL, LEAN CLAY: CL, dry, brown, w		1 2		I≱ A	<u>ឝ</u>   0	05	ΣŪ	<u> 22</u>	23	먹	2 in. Split
ss	24 24	40 21	-	roots, no odor, no visual impacts.	// 11	(FILL) CL			U.	ł		·			Spoon and
1X		6	-1	1-4' FILL, WELL-GRADED SAND: SW, I	olack					ļ	ĺ ´	1			140 lb Hammer.
$\wedge$		-	Ē	(10YR 2/1), dry, with cinders and slag.					.						i lanuner.
2 SS	24	2	<u>–</u> 2			(FILL)			0	ļ	1.	ł •			
ss	18	1 2 2	⊨ ⊟3			`sw´		· ·		ł	1	}			
١A				1					0		1				
			E-4	  1 3.9' moist.	,	, <b>-</b>		1	0						
3 SS	24 10	2 1 2	E	4 - 6' FILL, SILT WITH SAND: (ML)s, blac	k (10YR '	•		}	41.3	ł	· ·	ł	}		
)X	]	2	-5	2/1), wet, MGP-like odor, oil stained, sheen.		(FILL) (ML)s				1			}		
· //			E								-				
4	24	4	6	6 - 11' POORLY-GRADED SAND: SP, gra					21.2				1	ł	
ss∦	. 16	4 5 7 6	E ₇	brown (2.5Y 5/2), stained approximately 809 MGP-like odor, sheen, trace oil coating.	%, strong			j			ļ		} .	)	
IA I			F'	inclining offering areas in country.				]	39.4	1.					
_ []			F-8					]	1	i	1	1		ĺ	
5 SS	24 16	6 7 8 6	Ē			SP		]	109		Į				}
X		6	E-9		·	0.			132						
A			F	· ·	•			1	102	ſ	[	1		{	
6	24	8	F-10	9.8' -10' oil coated. 10' -11' MGP-like odor, sheen, dark gray sa	nd				3.3	1 .	{			1	}
6 SS	24 23	9 13 16	E	(10YR 4/1).		]			]						]
- IV				11 - 12' WELL-GRADED SAND: SW, gray	/ish	1			1.6	1					
$\sim L$	Y		E-12	brown (2.5Y 5/2), faint MGP-like odor, no od visual impact.	ior, no	sw					ł	1	ł	]	1
7 SS //	24 18	9 12 12 16	È "	12 - 18' POORLY-GRADED SAND: SP, g			1.		0	ļ			1		
	10	18	E13	brown (2.5Y 5/2), mostly sand [mostly fine] odor, no visual impacts.	, no										
			F			SP			0	1	ł	1	1	{	
8	24	7	14				1.	4	0	1	1		1		1
ss 🛛	20	9 11 13	Ē.				1.10	4	Ĭ		ł				
	L		- 15	l		<u> </u>	(·	<u> </u>	L	<u> </u>	<u> </u>				<u> </u>

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm Natural Resource Technology, Inc. 23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Tel: 262.523.9000 Fax: 262.523.9001
· · · · · · · · · · · · · · · · · · ·	Template: SOI	BORING - Project: NORTH PLANT.GPJ



		·	TEC	HNOLOGY							-	2	~	2
Sar	nple		1	Boring Number SB226	· ·	]			<u> </u>	Soil	Prop	ge 2 erties	ot	2
Number and Type	t. & (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	uscs	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf)			uíty .	P 200	RQD/ Comments
9 SS	24 14 ,	8 8 13 16	16 	12 - 18 POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine], no odor, no visual impacts. <i>(continued)</i>	SP			0 0 0						
10 SS	24 24	8 11 13 15		18 - 21' WELL-GRADED SAND: SW, grayish brown (2.5Y 5/2), wet.	sw			0						
11 SS	24 18 24	15 12 12 15 30	21	21 - 24' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine], rock chips in shoe.				0						
12 SS	10 24	30 23 11 14 , 7	-23	24 - 26' LEAN CLAY: CL, dark gray (10YR 4/1),	SP			0			-			
13 SS	16	7 17 21 15	-25 -26	trace sand [mostly fine], trace gravel [mostly fine]. 26' End of Boring.	CL			0						-
ţ														
									-					
												į		



Facility	//Projec	t Nam	e		License/	Pemit	Monitor	ning N	umber	i	Bonng	Pag Numbe	e 1	of	2
	-			lant Removal				· _ ی		ſ		SB2			
				f crew chief (first, last) and Firm	Date Dri	lling St	arted		Dat	e Drillin				Drilli	ng Method
Joe	Martir	ı		·					ļ					ho	llow stem
Test	: Servi	ce Ca	orporat				2012				7/2/2	012	_	au	ger
				Common Well Name	Final Sta				Surface	Elevat			Bo		Diameter
					<u> </u>	eet (N	AVD)			Feet (				8.3	inches
	Grid Or	igin	🛛 (es	stimated: (X) or Boring Location	1 r.		•	,		Local G	rid Loo	cation			
State	Plane			N, E $S/C/N$	La							<b>М</b> , N			ΜE
	1/4	of	1	/4 of Section , T N, R	Lon				<u> </u>		473 Fe	et⊟ S	43	2047	Feet 🗌 W
Facilit	y ID		•		state				ity/ or V	/illage					
			<b></b>	Lake	<u>IL</u>	l	Waul	cegan	T	<del></del>		<u></u>			·
San	nple						}	}	da		Soil	Ргоре	erties		1
	<b>अ</b> (म	s	5	Soil/Rock Description		ł	ł	{	La	0		1			
n	Sd (H	unt	Fe	And Geologic Origin For				1	1 S	(tsf		{			sit
žg	ver ver	ပိ	- u c	Each Major Unit		CS	in the second		0.6	gth g	art tur		ci,	<u> </u>	mer /
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet			l v	Graphic Log	Well	PID 10.6 cV Lamp	Compressive Strength (tsf)	Moisture Content	Liquid	Plasticity Index	200	RQD/ Comments
	13 m 24		L <u>P</u>	0 - 4' POORLY-GRADED SAND WITH SIL	<del>.</del>	<u>                                     </u>	្រ ជ ្រះពារ				20	년년	집권	<u> </u>	2 in. Split
ss	24 6	10 10 6	F	SP-SM, mostly sand [mostly coarse], some		}	211	1				ł	.		Spoon and
X	{ }	3	<u>-</u> 1	trace cinders, few slag.						1		{			140 /5
- IV			È '			1 .	211	{			}				Hammer.
2	24	3	-2	2' wet, trace cinders and glass debris, also w	bool	SP-SN		1	0		{		{ }		
2 SS	9	32	Ē	chips (probably tree roots), brown, trace cera				1		1	Į		į į		Į –
X		1	<u>-</u> 3	debris,				1	[	1	ĺ				
- V			Ē			Į		1	}		· ·	<b>)</b> .			
3	24	1	-4	4 - 18' POORLY-GRADED SAND: SP, darl	k				0	1	{	1	{	I	
3 SS	13	0 3 4	E	aravish brown (2.5Y 4/2), mostly sand (some	e fine,	1				1	· ·		ł	•	}
Å	{		E5	some medium], wet, no odor.					0		ł				At
/`	V		E,			{		1			(	1			approximately 5' start
4 SS	24	5	E ⁶			1	1.2		0		{	ļ		1	adding mud
ss	17	5 5 5 7	E7	•		1	1.2				]	}			while drilling
- IV			E'				3.1			}	}	1			to keep sand from
	Y		E-8				1.0	1		1	}		{		clogging
5	24	4 6 10 11	E.	· · · · · · · · · · · · · · · · · · ·				}	0		1	ł			augers.
ss≬	17	10 11	E-9	· · ·				1	1	1		l			
11	1	ĺ	ŧ,		•			1	1	1	( ·	{			
L	¥.		E-10	•		SP		1	.]	1	]	1			
6 SS	24 20	7	Ē.					2	0		}	1			
33	20	12 15 7	En		-						}	-	}		1
- ·  /	N .		Ē				1.17	2		}	1	ł	ł		
_ [	- ·	-	-12			ł	1.15	-			{		{		
7 SS	24 20	5 7 13 13	E	12' trace fine gravel.				]	0		1	ł			
		13	-13			{		1		1	:		ļ	l	1
	V		Ē	<b>1</b>		1				1	1		{	[	
	24	A	-14			}			0	1	1		) ·		
8 SS	19	6 8 9 6	F			}	1.					1		Į	
Y	Y	6	<u>F-15</u>	<u> </u>			1					<u> </u>			L
I here	by certi	fy that	the info	ormation on this form is true and correct to the be	st of my	knowie	dge.						-		
Signa	-	_			ural Res				v Ino		<u>-</u>	ral. 26'	2,523.9	000	
		1r	2.0-5	IT yours I Nat	mai rres	ouice	1 CULI	າບເບຊ	у, шс.			161. 20.	4.523.9	<b>UU</b> U	

Signature Tring It Clause	Finn Natural Resource Technology, Inc.	Tel: 262,523,9000
, <u>0</u> , <u></u>	23713 W. Paul Road, Suite D, Pewaukee, WI 53072	Fax: 262.523.9001
	Template: SOI	BORING - Project NORTH PLANT GRI



			TEC	HNOLOGY Boring Number SB227						Par	ge 2	of	2
Sar	nple				}	1		<u>e</u> .	So	l Prop			·
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID 10.6 eV Lamp	Compressive Strength (tsf) Moisture		ity	P 200	RQD/ Comments
9 SS	24 23	7 13 16 30	-16 17	4 - 18' POORLY-GRADED SAND: SP, dark grayish brown (2.5Y 4/2), mostly sand [some fine, some medium], wet, no odor. (continued) 17.2' -18' some coarse sand, trace fine gravel.	SP			0					
10 55	24 16	15 13 17 11	-18 -19 -20	18 - 18.9' WELL-GRADED SAND WITH GRAVEL: (SW)g, some sand [mostly fine], some gravel [mostly fine], wet, sub-rounded to sub-angular. 18.9 - 20' LEAN CLAY: to SILT: CL, gray (2.5Y 5/1), little gravel [some fine, some medium, some [ccarse], some silt, wet. 20' End of Boring.	(SW)g CL			0 0					
·													
												- - -	
•					-								



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|                    |                                 | _                   | IEC           | HNOLOGY                                                                             |             |              |                   |                 |                  |                               |                     | Pag        | e 1                 | of       | 2 ·                 |
|--------------------|---------------------------------|---------------------|---------------|-------------------------------------------------------------------------------------|-------------|--------------|-------------------|-----------------|------------------|-------------------------------|---------------------|------------|---------------------|----------|---------------------|
|                    | y/Projec                        |                     |               |                                                                                     | License     | Perint       | Monito            | ring Nu         | mber             |                               |                     | Numbe      | 2r                  |          |                     |
|                    |                                 |                     |               | lant Removal<br>f crew chief (first, last) and Firm                                 | Date Dr     | illing St    | arted             |                 | Dat              | e Drillin                     |                     | SB22       |                     | Drill    | ing Method          |
| Joe                | Martir                          | 1                   |               |                                                                                     |             | -            |                   |                 | }                |                               | -                   | -          |                     | ho       | llow stem           |
| Test               | t Servi                         | <u>ce Co</u>        | orporat       | 1011<br>Common Well Name                                                            | Final St    |              | /2012<br>ter Leve | 1 1             | Surface          | Elevat                        | 5/29/2<br>ion       | 012        | Bo                  |          | ger<br>Diameter     |
|                    |                                 |                     |               |                                                                                     |             | eet (N       |                   |                 |                  | Feet (                        | NAV                 |            |                     |          | inches              |
| Local  <br>State ] | Grid Ör<br>Plane                | igin                | 🛛 (es         | timated: $\boxtimes$ ) or Boring Location $\square$<br>N, E S/C/N                   | L           | at           | 0                 | ·               |                  | Local G                       | rid Loo             | cation     | r                   |          | ×Е                  |
|                    | 1/4                             | of                  | 1             | /4 of Section , T N, R                                                              | Lor         | 1g           | •                 |                 | u<br>            |                               | 166 Fe              | et S       | 43                  | 2109     | Feet 🗌 W            |
| Facilit            | y ID                            |                     |               |                                                                                     | State<br>IL |              | Civil T<br>Waul   | own/Ci<br>(egan | ty/ or V         | Village                       |                     |            |                     |          |                     |
| San                | nple                            |                     | r             |                                                                                     | <u> </u>    |              | 1                 |                 | đ                | <u> </u>                      | Soil                | Prope      | erties              |          |                     |
| <del>-</del>       | <b>अ</b> (मे                    | Ŋ                   | t             | Soil/Rock Description                                                               |             |              | }                 | ł               | PID 10.6 eV Lamp | 00                            |                     |            |                     |          | 1                   |
| т<br>Б             | Length Att. &<br>Recovered (in) | Counts              | Dcpth In Feet | And Geologic Origin For                                                             |             | s            | a                 | a               | 1.6 el           | Compressive<br>Strength (tsf) | it te               |            | ţţ                  |          | cnts                |
| Number<br>and Type | ength                           | Blow (              | cpth          | Each Major Unit                                                                     |             | SC           | Graphic<br>Log    | Well<br>Diagram | 910              | ompi                          | Moisture<br>Content | Liquid     | Plasticity<br>Index | 200      | RQD/<br>Comnents    |
| 11                 | 고 교<br>24                       | 4                   | - 9           | 0 - 0.2' FILL, POORLY-GRADED SAND W                                                 | /ITH        |              | - m               | ≯ <u>∩</u>      | <u>지</u><br>0    | 03                            | Σŭ                  | <u>ם ם</u> | <u> </u>            | <u>~</u> | 2 in. Split         |
| ss∦                | 19                              | 4                   | -1            | SILT: SP-SM, mostly sand [mostly fine], so<br>light brown.                          | me silt,    | SP-SN        |                   |                 |                  |                               |                     |            |                     |          | Spoon and<br>140 lb |
|                    |                                 |                     |               | 0.2 - 4.5' FILL, WELL-GRADED SAND: SW<br>brown to black with brick fragments, slag. | V, dry,     |              |                   |                 |                  |                               |                     | ł          | ,                   |          | Hammer.             |
| $s^2$              | 24<br>15                        | 1<br>1<br>2<br>2    | $E^2$         |                                                                                     |             | (FILL)<br>SW |                   |                 | 0                |                               |                     | }          |                     |          |                     |
|                    | 13                              | 2                   | <u>-</u> 3    |                                                                                     |             |              |                   |                 |                  |                               | }                   | ]          |                     |          | · ·                 |
| Ľ                  |                                 |                     | -4            | 3.5' moist.                                                                         |             | }            |                   |                 | }                |                               |                     | } .        |                     |          |                     |
| 3<br>SS            | 24<br>15                        | 1<br>5<br>11<br>5   | F             | 4' wet.<br>4.5 - 18' POORLY-GRADED SAND: SP, o                                      | live        | +            |                   |                 | 0                |                               |                     |            | ļ                   |          |                     |
| .  X               | }                               | U D                 | [5<br>[-      | brown (2.5Y 5/3), mostly sand [mostly medi                                          |             | ł            |                   |                 | 0                | ł                             |                     | }          |                     | } .      | } .                 |
| 4                  | 24                              | 2                   | <u>-</u> 6    | 6' -8' color changes to grayish brown (2.5Y 3                                       | 5/2)        | - <b>-</b>   |                   |                 | 0                |                               |                     | }          |                     | ļ        | ļ .                 |
| รริไ               | 16                              | 2<br>3<br>3<br>4    | -7            |                                                                                     |             | ł            |                   |                 | Ō                |                               |                     | ļ          |                     |          | }                   |
| - \/               |                                 |                     | Ę             |                                                                                     |             |              |                   |                 | 0                | }                             | ļ                   |            |                     |          |                     |
| 5                  | 24                              | 1                   | E-8           | 8' -10' grayish brown (2.5Y 5/2).                                                   |             |              |                   |                 | 0                | }                             |                     | }          | }                   |          | ľ                   |
| ss                 | 15                              | 4<br>8<br>9         | Ē-9           | -                                                                                   |             |              |                   |                 |                  |                               |                     |            |                     |          |                     |
| ľ                  |                                 |                     | Ē.            |                                                                                     |             | SP           |                   |                 |                  | ł                             |                     |            |                     |          | j ·                 |
| 6<br>SS            | 24<br>18                        | 6<br>7<br>10<br>10  | E 10          | 10.4' -10.5' lens of black well graded sand.                                        |             |              |                   | 4               | 0                | }                             | }                   |            | }                   |          | }                   |
| )                  |                                 | 10                  | En            |                                                                                     |             |              |                   |                 | 0                | ļ                             |                     | }          | } .                 |          |                     |
| _                  |                                 | _                   | -12           | 101 111 annum (2 51/ 5/0) 1                                                         | dođ         |              |                   | 3               | 0                |                               |                     |            |                     |          |                     |
| 7<br>55            | 24<br>21                        | 5<br>14<br>21<br>21 | Ë.            | 12' -14' grayish brown (2.5Y 5/2), poorly gra sand, mostly fine grained.            | ueu         |              |                   |                 |                  |                               |                     |            |                     |          |                     |
| ļ                  |                                 | .                   | -13           |                                                                                     |             |              |                   |                 |                  |                               |                     | }.         |                     |          | [.                  |
| 8<br>SS ()         | 24                              | 7                   | - 14          | :                                                                                   |             | }            |                   | 1               | 0                |                               | }                   | }          |                     |          |                     |
| ss                 | 18                              | 7<br>11<br>13       | E-15          |                                                                                     |             | } .          |                   |                 |                  |                               | }                   |            |                     |          | }                   |
| here               | by certi                        | fy that             | the info      | brmation on this form is true and correct to the b                                  | est of my   | knowle       | dge.              |                 | ···              |                               | ·                   |            | ·                   | · · · ·  |                     |

| Signature - | 2 11          | Firm | Natural Resource Technology, Inc.               | Tel: 262,523.9000             |
|-------------|---------------|------|-------------------------------------------------|-------------------------------|
|             | to the second |      | 23713 W. Paul Road, Suite D, Pewaukee, WI 53072 | Fax: 262.523.9001             |
|             |               | -    | Tomalate: SOH                                   | DODING Design NODTH DLANT ODI |

mplate: SOIL BORING - Project: NORTH PLANT.GPJ



TECHNOLOGY Boring Number SB228 Page 2 of 2 Soil Properties Sample PID 10.6 eV Lamp Length Att. & Recovered (in) Soil/Rock Description Compressive Strength (tsf) Depth In Feet Blow Counts RQD/ Comments Number and Type And Geologic Origin For Moisture Content Plasticity Index USCS Diagram Graphic Liquid Limit Each Major Unit P 200 Well Log 4.5 - 18' POORLY-GRADED SAND: SP, olive 0 brown (2.5Y 5/3), mostly sand [mostly medium]. (continued) -16 9 SS 24 24 6 10 10 12 0 16. SP -17 0 18 10 SS 24 24 18 - 21' WELL-GRADED SAND: SW, mostly 4558 0 sand [some fine, some medium, some coarse], wet. - 19 0 SW -20 6 12 17 17 11 24 0 SS 16 -21 21 - 22' POORLY-GRADED SAND: SP, grayish brown (2.5Y 5/2), mostly sand [mostly fine], trace 0 SP gravel [mostly fine]. -22 7 11 12 12 12 24 0 22 - 26' LEAN CLAY: CL, dark gray (10YR 4/1), SS 12 trace sand [mostly fine]. -23 Compression Strength >4.5 tsf. 0 -24 13 SS CL 24 8 11 13 16 18 -25 Compression Strength >4.5 tsf. -26 26' End of Boring.



|                    |                                 |                  | •                 |                                                                                    |                  |                                              |                                        |                 |                  | 1                             |                     | Pag                                          |                     | of        | 2                                       |
|--------------------|---------------------------------|------------------|-------------------|------------------------------------------------------------------------------------|------------------|----------------------------------------------|----------------------------------------|-----------------|------------------|-------------------------------|---------------------|----------------------------------------------|---------------------|-----------|-----------------------------------------|
| Facility           |                                 |                  |                   | lant Removal                                                                       | License/         | Permit                                       | Monitor                                | nn <u>g N</u>   | umber            |                               | Boring              | Number<br>SB22                               |                     |           |                                         |
|                    |                                 |                  |                   | of crew chief (first, last) and Finn                                               | Date Dri         | Iling St                                     | arted                                  | _,              | Da               | te Drilli                     | ng Con              |                                              |                     | Drill     | ing Method                              |
|                    | Martin                          |                  |                   |                                                                                    |                  | •                                            |                                        |                 | 1.               |                               | •.                  | -                                            |                     |           | llow stem                               |
| Test               | t Servi                         | <u>ce Co</u>     | orpora            |                                                                                    | 1                |                                              | /2012                                  |                 |                  |                               | 5/29/2              | 012                                          |                     | <u>au</u> | ger                                     |
|                    | •                               |                  |                   | Common Well Name                                                                   | Final Sta        |                                              | ter Leve<br>AVD)                       | 1               | Surfac           | c Elevat<br>Feet (            |                     | $\mathbf{D}$                                 | Bo                  |           | Diameter<br>inches                      |
| Local              | Grid Or                         | igin             | 🛛 (e:             | stimated: 🛛 ) or Boring Location                                                   | <u>]ī</u>        |                                              |                                        | -               |                  | Local G                       |                     |                                              |                     |           | menes                                   |
| State              |                                 | J                | - `               | N, E S/C/®                                                                         | La               | ıt                                           | <u> </u>                               | <u> </u>        | '                | •                             |                     | 🛛 N                                          | Ι.                  |           | ΣE                                      |
|                    | 1/4                             | of               | 1                 | 1/4 of Section , T N, R                                                            | Lon              |                                              | <u> </u>                               | <u> </u>        |                  |                               | 462 Fe              | et⊡ S                                        | 43                  | 32175     | Feet 🗌 W                                |
| Facilit            | уD                              |                  |                   |                                                                                    | State<br>IL      |                                              | Civil To                               |                 | -                | Village                       | •                   | •                                            | ·                   | • •       |                                         |
|                    | nple                            |                  | <u> </u>          |                                                                                    | <u>11</u>        | 1                                            | Wauk                                   | legan           |                  | <u> </u>                      | Soil                | Prope                                        | urti oc             |           |                                         |
| <u>.</u>           |                                 |                  |                   |                                                                                    |                  |                                              |                                        |                 | PID 10.6 eV Lamp |                               |                     | Tiope                                        |                     |           |                                         |
|                    | Length Att. &<br>Recovered (in) | ints             | Depth In Feet     | Soil/Rock Description                                                              |                  |                                              |                                        |                 | eV I             | Compressive<br>Strength (tsf) |                     | }                                            |                     |           | 5                                       |
| ype                | h Al<br>/erec                   | Cou              | [ q]              | And Geologic Origin For                                                            |                  | S                                            | Ę.                                     | una<br>ma       | 0.6              | gth (                         | nre<br>bt           |                                              | city                |           | Dent                                    |
| Number<br>and Type | Length Att.<br>Recovered (      | Blow Counts      | epth              | Each Major Unit                                                                    |                  | SC                                           | Graphic<br>Log                         | Well<br>Diagram | i a              | di i                          | Moisture<br>Content | Limit                                        | Plasticity<br>Index | 200       | RQD/<br>Comneuts                        |
|                    | 고 교<br>24                       |                  | <u>  <u>A</u></u> | 0 - 4.3' FiLL: (FILL), Gypsum wall board, whi                                      |                  | <u>                                     </u> | 다이                                     | 1 <u>× </u>     |                  | 10 %                          | <u>≥ 0</u>          | <u>                                     </u> | 신권                  | <u>4</u>  | 고 · · · · · · · · · · · · · · · · · · · |
| ss∖∖               | 20                              | 2<br>2<br>3<br>4 | Ē                 | approximately 20% mottled orange, trace roo                                        | ts and           | }                                            | 0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+0+ |                 | ľ                |                               |                     | ł                                            |                     |           | Spoon and                               |
| - IX               |                                 | ,                | <u>-1</u>         | sand.                                                                              |                  | {                                            |                                        |                 | 0                |                               |                     | ł                                            |                     |           | 140 lb<br>Hammer.                       |
| Ľ                  | . [                             |                  | E-2               | · ·                                                                                |                  | 1                                            | 010101                                 |                 | {                | 1                             |                     | [                                            |                     |           | ĺ                                       |
| 2<br>SS            | 24<br>16                        | 3                | Ē                 | 2' wet with sulfur-like odor, trace wood debris                                    | 5.               | (FiLL)                                       | 0101010                                |                 | 0                |                               |                     | ł                                            |                     |           |                                         |
|                    |                                 | 1<br>2           | -3                | · ·                                                                                | •                |                                              | 0+0+0+0+                               |                 | 0                |                               |                     |                                              |                     |           |                                         |
| ĮΛ                 |                                 |                  | E                 |                                                                                    |                  |                                              | 0101010                                |                 |                  |                               |                     |                                              |                     |           |                                         |
| 3                  | 24                              | 2                | E <sup>4</sup>    |                                                                                    | <u>.</u>         | <u>.</u>                                     | 2101010                                |                 | 0                | 1                             | [·                  | Į –                                          |                     | [         |                                         |
| ss                 | 19                              | 2<br>2<br>3<br>2 | E-5               | 4.3 - 8' POORLY-GRADED SAND: SP, data<br>(10YR 4/1), mostly sand [mostly medium],  | rk gray          |                                              |                                        |                 |                  |                               |                     | ,                                            |                     | Į         |                                         |
| - IA               |                                 |                  | Ę                 | sulfur-like odor.                                                                  |                  | }                                            |                                        |                 | 0                |                               |                     | }                                            |                     |           |                                         |
| A F                | 24                              | 1                | <u>–</u> 6        | 6' -8' no sulfur-like odor.                                                        |                  |                                              |                                        |                 | 0                |                               |                     | {                                            |                     |           | ľ                                       |
| 4<br>ss            | 8                               | 1<br>1<br>12     | E.                |                                                                                    |                  | SP                                           |                                        |                 |                  |                               | [                   | 1                                            | 1                   |           | [                                       |
| X                  |                                 | 12               | E-7               |                                                                                    |                  | ļ                                            |                                        |                 |                  |                               | }                   |                                              |                     |           | · .                                     |
| $\mathbb{N}$       | ¥ I                             |                  | E<br>8            |                                                                                    |                  |                                              |                                        |                 |                  |                               | }                   |                                              | 1                   | 2         |                                         |
| - 55               | 24<br>12                        | 2<br>2<br>1<br>2 | E°                | 8 - 10.4' WELL-GRADED SAND: SW, dark<br>(10YR 4/1), mostly sand [some fine, some n | : gray<br>nedium |                                              |                                        |                 | 0                |                               | {                   | 1                                            |                     | ł         |                                         |
| - 35 IV            |                                 | 2                | E-9               | some coarse], no odor and no visual impacts                                        | i.               | {                                            |                                        |                 |                  | }                             |                     | {                                            | 1                   | ļ.        | · ·                                     |
| $\wedge$           |                                 |                  | F.                | . · · ·                                                                            |                  | SW                                           |                                        |                 | 1                |                               | ļ                   | Į                                            |                     | }         | 1                                       |
| 6                  | 24                              | 5                | F10               |                                                                                    |                  |                                              |                                        |                 | 0                |                               | ł                   |                                              |                     | 1         |                                         |
| 6<br>SS            | 19                              | 10<br>11<br>13   | EII               | 10.4 - 23.5 POORLY-GRADED SAND: SF<br>gray (10YR 4/1), mostly sand [mostly fine].  | , dark           | [                                            |                                        | }               |                  |                               |                     |                                              |                     |           |                                         |
| I.                 |                                 |                  | E.                | gray (10 th 4/1), mostly sand (mostly ime).                                        |                  |                                              |                                        | 1               | 0                |                               | 1                   |                                              |                     |           |                                         |
| _ [                |                                 | •                | E-12              | 101 Is at a instance security because (2.5V.5)                                     | 0)               |                                              |                                        |                 |                  |                               |                     | ļ                                            |                     |           |                                         |
| 7<br>SS            | 24<br>18                        | 5<br>8<br>8      | Ę.                | 12' color changing to grayish brown (2.5Y 5/                                       | 2).              |                                              |                                        |                 | 0                |                               | }                   | · ·                                          | Ì                   |           |                                         |
| X                  |                                 | 8                | -13               |                                                                                    |                  | SP                                           | 37                                     |                 | 0                |                               |                     |                                              |                     | ł         |                                         |
| l (V               | <b>≬</b> .                      |                  | F                 |                                                                                    |                  | 1                                            |                                        | ļ               | 1                |                               |                     | [                                            |                     | 1         |                                         |
| ss X               | 24<br>18                        | 3                | E <sup>14</sup>   | 14' trace fine gravel.                                                             |                  | 1                                            |                                        |                 | 0                |                               | }                   | ·                                            | 1                   |           |                                         |
| 55 M               | 18                              | 4<br>8           | E 15              |                                                                                    |                  | {                                            | 1.                                     | ł               |                  |                               | 1                   |                                              |                     | ł         |                                         |
| I herel            | by certif                       | ly that          | the info          | ormation on this form is true and correct to the be                                | st of my l       | knowle                                       | dge.                                   | <b>.</b>        | <b></b>          |                               | •                   | ·                                            | · · ·               | <u></u>   | <u>'</u>                                |
| Signal             |                                 | 7                |                   |                                                                                    | ural Res         |                                              |                                        | പിറത            | z. Inc           |                               |                     | Fel: 262                                     | 2.523.9             | 000       |                                         |
|                    | /<                              | _لح              | -#=               | 1.44                                                                               | 3 W. Pau         |                                              |                                        |                 |                  | <u>WI 530</u>                 |                     |                                              | 2.523.9             |           |                                         |
|                    |                                 |                  |                   |                                                                                    |                  |                                              |                                        |                 | Te               | mplate: S                     | SOIL B              | ORING                                        | - Project           | : NOR     | TH PLANT.GPJ                            |



|                    |                                 | •                   |               | Boring Number SB229                                                                                      |           |                |                 |                  |                               |                     | Pag             | ge 2                | of    | 2                    |
|--------------------|---------------------------------|---------------------|---------------|----------------------------------------------------------------------------------------------------------|-----------|----------------|-----------------|------------------|-------------------------------|---------------------|-----------------|---------------------|-------|----------------------|
| Sar                | nple                            |                     |               |                                                                                                          |           |                |                 | dia              |                               | Soil                | Prope           | rties               |       | 1                    |
| .*                 | t.<br>(ii) &                    | ats                 | cet           | Soil/Rock Description                                                                                    |           |                |                 | V La             | sf) ve                        |                     |                 |                     |       |                      |
| ype<br>Ype         | th At<br>verec                  | Cou                 | In F          | And Geologic Origin For<br>Each Major Unit                                                               | cs        | lic            | am              | 0.6 c            | oressi<br>gth (t              | ure                 | -               | city                |       | nents                |
| Number<br>and Type | Length Att. &<br>Recovered (in) | Blow Counts         | Depth In Feet |                                                                                                          | u s c     | Graphic<br>Log | Well<br>Diagram | PID 10.6 eV Lamp | Compressive<br>Strength (tsf) | Moisture<br>Content | Liquid<br>Limit | Plasticity<br>Index | P 200 | RQD/<br>Comments     |
| <u> </u>           |                                 |                     |               | 10.4 - 23.5' POORLY-GRADED SAND: SP, dark                                                                |           |                | ГЦ              | 0                |                               | 2.0                 |                 | н                   |       |                      |
|                    | 24                              | 9                   | -16           | gray (10YR 4/1), mostly sand [mostly fine].<br>(continued)                                               |           |                |                 | 0                |                               |                     |                 |                     |       |                      |
| 9<br>SS            | 20                              | 9<br>11<br>13<br>17 | È.,           |                                                                                                          |           |                |                 | U                |                               |                     |                 |                     |       |                      |
| · · M              |                                 |                     | E-17          |                                                                                                          |           |                |                 | 0                |                               | 1                   |                 |                     |       |                      |
| 10                 | 24                              | 7                   | 18            | 18' mostly fine grained sand.                                                                            | ·         |                |                 | 0                |                               |                     |                 |                     |       |                      |
| 10<br>SS           | 21                              | 7<br>9<br>15<br>16  | -<br>19       |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
| M                  |                                 |                     | E             |                                                                                                          | SP        |                |                 | 0                |                               |                     |                 |                     |       |                      |
| 11<br>SS           | 24<br>20                        | 8<br>11<br>11<br>13 | E-20          | 20' trace fine gravel.                                                                                   |           |                |                 | 0                |                               |                     |                 |                     |       |                      |
| 22                 | 20                              | 11<br>13            | 21            |                                                                                                          |           |                |                 | 0                |                               |                     |                 |                     |       |                      |
| Į.                 | ŀ                               |                     |               |                                                                                                          |           |                |                 | U                |                               |                     |                 |                     |       |                      |
| 12<br>SS           | 24<br>18                        | 4<br>8<br>9<br>12   | -22           | :                                                                                                        |           |                |                 | 0                |                               | i                   |                 |                     |       |                      |
| X                  |                                 | 12                  | 23            |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
| . Ľ                |                                 |                     | -24           | 23.5 - 24' LEAN CLAY: CL, dark gray (10YR 4/1),<br>\trace sand [mostly fine], trace gravel [trace fine]. | CL        | $\mathbb{Z}$   |                 | 0                |                               |                     |                 |                     |       | Compressive strength |
|                    |                                 |                     |               | 24' End of Boring.                                                                                       |           |                |                 |                  |                               |                     |                 |                     |       | >4.5 tsf.            |
|                    |                                 | •                   |               |                                                                                                          |           | :              |                 |                  |                               |                     |                 |                     |       |                      |
| •                  |                                 |                     |               |                                                                                                          | ۰.        |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 | •                   |               |                                                                                                          |           | ( (            |                 |                  |                               |                     |                 |                     |       |                      |
|                    | 1                               |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          | <u>``</u> |                |                 |                  | ]                             |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 | ·                |                               |                     |                 |                     |       |                      |
| ·                  |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       | 1                    |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     | -     |                      |
|                    |                                 |                     |               | · · · ·                                                                                                  |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               | τ                                                                                                        |           |                |                 |                  |                               |                     |                 |                     |       |                      |
|                    |                                 |                     |               |                                                                                                          |           |                |                 |                  |                               | •                   |                 |                     |       |                      |
|                    | . 1                             |                     |               | 1                                                                                                        |           | · ·            | 1               |                  | ı I                           | I                   | l               |                     |       |                      |

## **APPENDIX B**

## IN SITU SOLIDIFICATION/STABILIZATION (ISS) TREATABILITY STUDY REPORT DATA

# APPENDIX B1

# **ISS MIX BATCH WORKSHEETS**

| Г  |              |                    |                | TELY                                                                                      |             | 1874 Forge         | Street Tucke    | r. GA 300      | 84                                           |                   | . · ·        |
|----|--------------|--------------------|----------------|-------------------------------------------------------------------------------------------|-------------|--------------------|-----------------|----------------|----------------------------------------------|-------------------|--------------|
|    |              | TE S               | *              | GINEER                                                                                    | ING         | Phone: 770-        |                 |                | *                                            | · .               |              |
|    |              |                    | Soi            |                                                                                           |             | Fax: 770-92        |                 | A              |                                              |                   |              |
| ļ  |              | $\triangle$        |                | STS, LLC                                                                                  |             | Web: <u>www.te</u> |                 |                |                                              |                   |              |
| _  |              | · · · ·            |                | <b>31</b> , <b>11</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , <b>1</b> , |             |                    | · · · · ·       |                |                                              |                   |              |
|    |              |                    |                |                                                                                           | Bat         | ch Wo              | rkshe           | et             | <u> </u>                                     |                   |              |
|    | · [          | BATCH-SAN          | /IPLE ID       |                                                                                           |             | 13794/1-1          |                 |                |                                              | BATCH #           | 1            |
| PF |              |                    | 1230-02-1      |                                                                                           | LOCA        | TION               | Composi         | te Area A      | ,B,C,D                                       | MIXING TECH       | RI/AV 1      |
| PF | R. NAME      | Former             | North Plant MG | P Site                                                                                    | SAMPLE TY   | PE                 |                 | Mold           |                                              | BATCH DATE        | 6/27/2012    |
|    | Time Batch I | Miving Stor        | tod            |                                                                                           |             |                    |                 | Soil           | Moistur                                      | e Mass, g         | 3519.0       |
|    | Total Time B | -                  |                |                                                                                           |             |                    |                 |                |                                              | Content, %        | 30.6         |
|    | Time Batch ( |                    | -              |                                                                                           |             |                    | •               |                |                                              | nent Used         | <u> </u>     |
|    | and Baton    | Completely         | III MOIQS      |                                                                                           |             |                    | Grout W         |                |                                              | olids) Ratio*     | 0.80         |
|    |              |                    | Mix            | Constitue                                                                                 | nts:        | _                  |                 |                | ass of Dr                                    | •                 | 11500.0      |
| Co | omponent     | Com                | ponent         |                                                                                           | ount,       | ļ ,                | <u></u>         | Total V        | Vater/Cei                                    | n. Mat. Ratio     | 5.900        |
|    | ID           | . Na               | ame            | % (based on<br>soil dry<br>mass)                                                          | g           |                    |                 |                | Remark                                       | (S                |              |
|    | 13794        | Soil               | (wet)          | 100.0                                                                                     | 15019.0     | x.                 |                 | ml of u        | ator wae                                     | added to make     |              |
|    | 13823        | GGBFS              | Grade 100      | 4.5                                                                                       | 517.5       |                    |                 |                |                                              | e/moldable        |              |
|    | 13822        | Cemen              | t type I/II    | 1.5                                                                                       | 172.5       |                    |                 |                |                                              | •                 |              |
|    | 10112        | Ben                | tonite         | , 0.0.                                                                                    |             |                    | * Comentaur     | Matariala (    | <br>colida) in tat                           | al mass of GGBFS, | :<br>htouita |
|    |              |                    |                |                                                                                           |             |                    | and cement      | iviaici iais ( | 501105) 15 100                               | at mass of GGBro, | bentonne     |
|    |              | Wate               | er, mL         | 5                                                                                         | 52          |                    |                 |                |                                              |                   |              |
| [  |              | · · · ·            | Required       | Nominal                                                                                   | Mold Size   | Temping            | · .             |                | End Pre                                      | eparation         |              |
|    | Sampl        | le iD              | Test           | Diam., in.                                                                                | Height, in. | Tamping<br>Tech    | Removal<br>Tech | Trim<br>Tech   | Method                                       | Com               | nents        |
|    | 13794-       | 1- <b>1</b> -1     | MC             | 3                                                                                         | 6           |                    |                 |                |                                              | After             | Mixing       |
|    | 13794-       | 1-1-2              | UCS            | 3                                                                                         | 6           |                    | · ·             |                |                                              | 7 d               | ays          |
|    | 13794-       | 1-1-3              | UCS            | 3                                                                                         | 6           |                    |                 |                |                                              | 14 (              | lays         |
|    | 13794-       | 1-1-4              | UCS            | 3                                                                                         | 6           |                    |                 |                | <b></b>                                      | 28 (              | lays         |
|    | 13794-       |                    | Perm           | 3                                                                                         | 3           |                    |                 |                | <b> </b>                                     |                   | ays          |
|    | 13794-       |                    | Perm           | 3                                                                                         | 3           |                    | -               |                | <u> </u>                                     | · · · · ·         | days         |
|    | 13794-       |                    | Perm           | 3                                                                                         | 3           |                    |                 |                | <u>                                     </u> | , 28 (            |              |
|    | 13794-       |                    | Penetration    | 3                                                                                         | 3           |                    | -               |                | <u> </u>                                     |                   | 3 days       |
|    | 13794-       |                    | ANS16-1        | 2                                                                                         | 4           | ļ                  |                 |                | ļ                                            |                   | days ???     |
|    | 13794-1-1    |                    | Wet Dur        | . 2                                                                                       | 4           | · ·                |                 |                | <u> </u>                                     |                   | r 28 days??? |
|    | 13794-1-1    |                    | Fr. Dur.       | 2                                                                                         | 4           |                    |                 |                | <u> </u>                                     |                   | r 28 days??? |
|    | 13794-2      |                    | Extra          | 2                                                                                         | 4           |                    |                 |                |                                              | UCS Spare         |              |
|    | 13794-       |                    | Extra          | 3                                                                                         | 3           |                    |                 |                | <u> </u>                                     | Perm Spare        |              |
|    | 13794-1      |                    | Swell          | 3                                                                                         | 6           | <b> </b>           |                 |                | ļ                                            |                   | days ???     |
|    | 13794-1      |                    | Extra          | 2                                                                                         | 4           |                    |                 |                | <u> </u>                                     | Extra UCS         |              |
|    | 13794-1      |                    | Extra          | 3                                                                                         | 3           | <b> </b>           |                 |                | <u> </u>                                     | Extra Perm        |              |
|    | 13794-1-1    | I-(25 <b>-</b> 26) | Extra          | -                                                                                         | -           | ]                  |                 |                |                                              | Extra             |              |

|                                       | TE S                   | Êr. Er<br>So       |                                  | •           | 1874 Forge<br>Phone: 770<br>Fax: 770-92 |                                                                  | er, GA 300  |                | · · · · · · · · · · · · · · · · · · · |                          |  |  |  |  |
|---------------------------------------|------------------------|--------------------|----------------------------------|-------------|-----------------------------------------|------------------------------------------------------------------|-------------|----------------|---------------------------------------|--------------------------|--|--|--|--|
|                                       |                        | Tr Tr              | STS, LLC                         | y .         | Web: <u>www.t</u>                       | est-lic.com                                                      |             |                |                                       |                          |  |  |  |  |
|                                       |                        |                    |                                  | Bat         | tch Wa                                  | orkshe                                                           | et          |                |                                       |                          |  |  |  |  |
|                                       | BATCH-SAM              |                    | <u> </u>                         |             | 13794/2-1                               |                                                                  |             |                | BATCH #                               | 1                        |  |  |  |  |
| PR. NUMBER                            |                        | 1230-02-1          |                                  | LOCA        |                                         | Compos                                                           | ite Area A  |                | MIXING TECH                           | RI/AV                    |  |  |  |  |
| PR. NAME                              | Former                 | North Plant MC     | SP Site                          | SAMPLE TY   | PE                                      |                                                                  | Mold        |                | BATCH DATE                            | 6/27/2012                |  |  |  |  |
|                                       |                        |                    |                                  | •<br>       |                                         | <br>                                                             |             |                |                                       |                          |  |  |  |  |
| Time Batch                            | Mixing Star            | ted                |                                  |             |                                         |                                                                  |             |                | e Mass, g                             | 3519.0                   |  |  |  |  |
| Total Time                            |                        |                    |                                  |             | <u> </u>                                |                                                                  |             |                | Content, %                            | 30.6                     |  |  |  |  |
| Time Batch                            | Completely             | in Molds           |                                  | L           |                                         | 0                                                                |             |                | nent Used                             | /  <br>                  |  |  |  |  |
|                                       |                        | Mix                | Constitue                        | ents:       |                                         | Grout V                                                          |             | -              | olids) Ratio*<br>ry Soil, g           | 0.80                     |  |  |  |  |
| Component                             | Com                    | ponent             |                                  | ount,       | ļ -                                     |                                                                  |             |                | m. Mat. Ratio                         |                          |  |  |  |  |
| ID                                    | Na                     | ame                | % (based on<br>soil dry<br>mass) | g           |                                         |                                                                  |             | Remari         | ks                                    |                          |  |  |  |  |
| 13794                                 | Soil                   | (wet)              | 100.0                            | 15019.0     |                                         | 0 mL of water was added to make                                  |             |                |                                       |                          |  |  |  |  |
| 13823                                 | GGBFS                  | Grade 100          | 6.0                              | 690.0       |                                         |                                                                  |             |                | e/moldable                            | -                        |  |  |  |  |
| 13822                                 | Cemen                  | it type I/II       | 2.0                              | 230.0       |                                         |                                                                  |             |                |                                       |                          |  |  |  |  |
| 10112                                 | 1                      | tonite             | 0.0                              |             |                                         | * Cementous Materials (solids) is total mass of GGBFS, bentonite |             |                |                                       |                          |  |  |  |  |
|                                       |                        |                    |                                  |             |                                         | * Cementous<br>and cement                                        | Materials ( | solids) is tot | al mass of GGBFS,                     | bentonite                |  |  |  |  |
| ·•••                                  | Wat                    | er, mL             | 7                                | 36          |                                         |                                                                  | -           |                |                                       |                          |  |  |  |  |
|                                       |                        | Demoired           | l Mansimal                       | Mold Size   | L<br>                                   | ······                                                           | _`          | End Dr         | eparation                             |                          |  |  |  |  |
| Sam                                   | ole ID                 | Required<br>Test   |                                  | T           | Tamping<br>Tech                         | Removal                                                          | Trim        |                |                                       |                          |  |  |  |  |
|                                       | ,<br>                  |                    | Diam., in.                       | Height, in. | Тесп                                    | Tech                                                             | Tech        | Method         | Lomr                                  | nents                    |  |  |  |  |
| · · · · · · · · · · · · · · · · · · · | -2-1-1                 | MC                 | 3                                | 6           |                                         |                                                                  |             |                |                                       | Mixing                   |  |  |  |  |
|                                       | -2-1-2                 | UCS                | 3                                | 6           |                                         |                                                                  |             |                | {                                     | ays                      |  |  |  |  |
|                                       | -2-1-3                 | UCS                | 3                                | 6           |                                         |                                                                  |             |                |                                       | lays                     |  |  |  |  |
|                                       | -2-1-4                 | UCS                | 3                                | 6           | -                                       |                                                                  |             |                |                                       | lays                     |  |  |  |  |
|                                       | -2-1-5                 | Perm               | 3                                | 3           |                                         |                                                                  | . <u> </u>  |                |                                       | ays                      |  |  |  |  |
|                                       | -2-1-6                 | Perm               | <u>` 3</u>                       | 3           |                                         |                                                                  |             |                |                                       | days                     |  |  |  |  |
|                                       | -2-1-7                 | Perm               | 3                                | 3           |                                         |                                                                  |             |                |                                       | days                     |  |  |  |  |
|                                       | -2-1-8                 | Penetration        |                                  | 3           | l                                       |                                                                  |             |                | l                                     | 3 days                   |  |  |  |  |
|                                       | -2-1-9<br>1-(10-14)    | ANS16-1<br>Wet Dur | 2                                | 4           |                                         |                                                                  |             |                |                                       | days ???<br>r 28 days??? |  |  |  |  |
|                                       | 1-(10-14)<br>1-(15-19) | Fr. Dur.           | 2                                | 4           |                                         |                                                                  |             |                |                                       | r 28 days???             |  |  |  |  |
|                                       | -2-1-20                | Extra              | 2                                | 4           |                                         |                                                                  |             |                | UCS Spare -                           | . 20 Juyo ! [ ]          |  |  |  |  |
|                                       | -2-1-20<br>-2-1-21     | Extra              | 3                                | 3           | <u> </u>                                |                                                                  | <u> </u>    |                | Perm Spare                            | · <b>-</b> .             |  |  |  |  |
|                                       |                        | Swell              | 3                                | 6           |                                         |                                                                  |             | l              | •                                     | days ???                 |  |  |  |  |
| 13794-                                |                        |                    |                                  |             | <u> </u>                                | t                                                                |             | 1              | Extra UCS                             |                          |  |  |  |  |
| 13794-<br>13794-                      | -2-1-23                | Extra              | 2                                | 4           |                                         |                                                                  |             |                | Exira UCS                             |                          |  |  |  |  |
| 13794-                                | -2-1-23<br>-2-1-24     | Extra<br>Extra     | 2                                | 4           |                                         | <u> </u>                                                         |             |                | Extra DCS                             |                          |  |  |  |  |

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|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------|---------------------------------------|-----------------|--------------|------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------|
|                                                                                                                                        | TE ST                                                                                                                                |                                                                                                         | GINEER                                              | · •                                            | Phone: 770-                           |                 |              | 6-               |                                                                                                  |                                                   |
|                                                                                                                                        |                                                                                                                                      | - Soi                                                                                                   |                                                     | 1                                              | Fax: 770-923                          |                 | A            |                  |                                                                                                  |                                                   |
| .                                                                                                                                      | $\square$                                                                                                                            | · · · ·                                                                                                 | STS, LLC                                            | ( )                                            | Web: <u>www.te</u>                    |                 | AA13.        | र्थ ह <b>।</b> ¥ |                                                                                                  |                                                   |
|                                                                                                                                        |                                                                                                                                      | <u> </u>                                                                                                | <u></u>                                             |                                                |                                       | orkshee         | et           |                  |                                                                                                  |                                                   |
|                                                                                                                                        | BATCH-SAM                                                                                                                            | PLE ID                                                                                                  |                                                     |                                                | 13794/3-1                             |                 |              | 7                | BATCH#                                                                                           | [                                                 |
| PR. NUMBER                                                                                                                             |                                                                                                                                      | 1230-02-1                                                                                               | 1                                                   | LOCA                                           | TION                                  | Composi         | ite Area A,  | ,B,C,D           | MIXING TECH                                                                                      | RI/                                               |
| PR. NAME                                                                                                                               | Former N                                                                                                                             | lorth Plant MGF                                                                                         | Site                                                | SAMPLE TYP                                     | PE                                    |                 | Mold         |                  | BATCH DATE                                                                                       | 6/27/                                             |
| Time Batch                                                                                                                             | Mixing Starte                                                                                                                        |                                                                                                         |                                                     |                                                | 1                                     |                 | Soil         | Moistur          | e Mass, g                                                                                        | 351                                               |
|                                                                                                                                        | Batch was Mi                                                                                                                         |                                                                                                         | l                                                   |                                                |                                       |                 |              |                  | Content,`%                                                                                       | 30                                                |
|                                                                                                                                        | Completely in                                                                                                                        |                                                                                                         |                                                     |                                                |                                       |                 | Тур          | e of Cem         | ent Used                                                                                         | · · i/                                            |
|                                                                                                                                        |                                                                                                                                      |                                                                                                         | •                                                   |                                                |                                       | Grout W         |              |                  | olids) Ratio*                                                                                    | <u>0</u> .                                        |
| Component                                                                                                                              | Comp                                                                                                                                 |                                                                                                         | Constitue                                           | nts:<br>ount,                                  | ł                                     | `               |              | ass of Dr        | y Soil, g<br>n. Mat. Ratio                                                                       | 3.8                                               |
| •                                                                                                                                      | Compo<br>Nar                                                                                                                         |                                                                                                         | % (based on<br>soil dry                             |                                                | · - [                                 |                 |              | Remark           |                                                                                                  | 1 3.0                                             |
| ID .                                                                                                                                   |                                                                                                                                      |                                                                                                         | mass)                                               |                                                |                                       | <b> </b>        |              |                  |                                                                                                  |                                                   |
| 13794                                                                                                                                  | Soil (                                                                                                                               |                                                                                                         | 100.0                                               | 15019.0                                        |                                       |                 |              |                  | added to make                                                                                    | <b>,</b>                                          |
| 13823                                                                                                                                  | GGBFS G                                                                                                                              |                                                                                                         | .7.5                                                | 862.5                                          |                                       | ļ               | soil/grou    | it mixable       | /moldable                                                                                        | <u> </u>                                          |
| 13822                                                                                                                                  | Cement                                                                                                                               |                                                                                                         | 2.5                                                 | 287.5                                          | .                                     |                 |              |                  |                                                                                                  | · .                                               |
| 10112                                                                                                                                  | Bento                                                                                                                                | onite                                                                                                   | 0.0                                                 | · · · · · · · · · · · · · · · · · · ·          |                                       | 11              | Materials (s | solids) is tot   | al mass of GGBFS,                                                                                | bentonite                                         |
|                                                                                                                                        |                                                                                                                                      |                                                                                                         | <u>-</u>                                            |                                                |                                       | and cement      |              |                  |                                                                                                  |                                                   |
|                                                                                                                                        | Wate                                                                                                                                 | r, mL                                                                                                   | <u>.</u> Э.                                         | 20                                             | 1                                     | L               |              | ~ <del>~~~</del> |                                                                                                  |                                                   |
|                                                                                                                                        |                                                                                                                                      | Required                                                                                                | Nominal                                             | Mold Size                                      | Tamping                               |                 | ~            | End Pre          | paration                                                                                         |                                                   |
| Sạmp                                                                                                                                   | le ID                                                                                                                                | Test                                                                                                    | Diam., in.                                          | Height, in.                                    | Tech                                  | Removal<br>Tech | Trim<br>Tech | Method           | Comr                                                                                             | nents                                             |
|                                                                                                                                        | -3-1-1                                                                                                                               | MC                                                                                                      | 3                                                   | 6                                              |                                       | []              |              |                  | · After I                                                                                        | Mixing                                            |
| 13794                                                                                                                                  | -3-1-2                                                                                                                               | UCS                                                                                                     | 3                                                   | 6                                              |                                       | <u> </u>        |              |                  |                                                                                                  | ays                                               |
| 13794                                                                                                                                  | T                                                                                                                                    | UCS                                                                                                     | 3                                                   | 6                                              | 1                                     | <u> </u>        |              |                  |                                                                                                  | days                                              |
| 13794<br>13794                                                                                                                         |                                                                                                                                      |                                                                                                         |                                                     |                                                | t                                     | 1               |              | 1                |                                                                                                  | days                                              |
| 13794<br>13794<br>13794                                                                                                                | -3-1-4                                                                                                                               | UCS                                                                                                     | 3                                                   | 6                                              |                                       |                 |              |                  |                                                                                                  |                                                   |
| 13794<br>13794<br>13794<br>13794<br>13794                                                                                              | -3-1-4<br>-3-1-5                                                                                                                     | UCS<br>Perm                                                                                             | 3                                                   | 3                                              |                                       |                 |              |                  | 7 d                                                                                              | ave                                               |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794                                                                                     | -3-1-4<br>-3-1-5<br>-3-1-6                                                                                                           | UCS<br>Perm<br>Perm                                                                                     | 3<br>3                                              | 3<br>3                                         |                                       |                 |              |                  | · 14 c                                                                                           | ~ <u> </u>                                        |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794                                                                            | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7                                                                                                 | UCS<br>Perm<br>Perm<br>Perm                                                                             | 3<br>3<br>3                                         | 3<br>3<br>3                                    | · · · · · · · · · · · · · · · · · · · |                 |              |                  | 14 c<br>28 c                                                                                     | days                                              |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794                                                                   | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-8                                                                                       | UCS<br>Perm<br>Perm<br>Perm<br>Penetration                                                              | 3<br>3                                              | 3<br>3<br>3<br>3                               |                                       |                 |              |                  | 14 c<br>28 c<br>after 3                                                                          | days<br>3 days                                    |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794                                                                            | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-7<br>-3-1-8<br>-3-1-9                                                                   | UCS<br>Perm<br>Perm<br>Perm                                                                             | 3<br>3<br>3<br>3                                    | 3<br>3<br>3                                    |                                       |                 |              |                  | 14 c<br>28 c                                                                                     | days<br>3 days<br>days ??                         |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794                                                          | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-8<br>-3-1-9<br>1-(10-14)                                                                | UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1                                                   | 3<br>3<br>3<br>3<br>2                               | 3<br>3<br>3<br>3<br>4                          |                                       |                 |              |                  | 14 c<br>28 c<br>after 3<br>after 28 c                                                            | days<br>3 days<br>days ?7<br>r 28 day             |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794-3-                                                       | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-8<br>-3-1-9<br>1-(10-14)<br>1-(15-19)                                                   | UCS<br>Perm<br>Perm<br>Peretration<br>ANS16-1<br>Wet Dur                                                | 3<br>3<br>3<br>2<br>2<br>2                          | 3<br>3<br>3<br>3<br>4<br>4                     |                                       |                 |              |                  | 14 c<br>28 c<br>after 3<br>after 28 c<br>5 molds afte                                            | days<br>3 days<br>days ??<br>r 28 day             |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794-3-<br>13794-3-<br>13794-3-<br>13794-3-<br>13794-3-       | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-8<br>-3-1-9<br>1-(10-14)<br>1-(15-19)<br>3-1-20<br>3-1-21                               | UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.                            | 3<br>3<br>3<br>2<br>2<br>2<br>2                     | 3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>3      |                                       |                 |              |                  | 14 c<br>28 c<br>after 3<br>after 28 c<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare | days<br>3 days<br>days ??<br>r 28 day<br>r 28 day |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794-3-<br>13794-3-<br>13794-3-<br>13794-<br>13794-<br>13794- | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-8<br>-3-1-9<br>1-(10-14)<br>1-(15-19)<br>3-1-20<br>3-1-21<br>3-1-22                     | UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra<br>Swell | 3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>3<br>3<br>3 | 3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>3<br>6 |                                       |                 |              |                  | 14 c<br>28 c<br>after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare<br>after 28  | days<br>3 days<br>days ??<br>r 28 day<br>r 28 day |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794<br>13794-3-<br>13794-3-<br>13794-3-<br>13794-<br>13794-<br>13794- | -3-1-4<br>-3-1-5<br>-3-1-6<br>-3-1-7<br>-3-1-8<br>-3-1-9<br>1-(10-14)<br>1-(15-19)<br>3-1-20<br>3-1-21<br>3-1-22<br>3-1-22<br>3-1-23 | UCS<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra                  | 3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>3           | 3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>3      |                                       |                 |              |                  | 14 c<br>28 c<br>after 3<br>after 28 c<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare | days<br>3 days<br>days ??<br>r 28 day<br>r 28 day |

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|          |                                                                                                                               | 7                                                                                                                                                                     | 'I'u                                                                                                                  | MELY                                                                                   |                                                               | 1874 Forge        | Street Tucks              | er, GA 30   | 084           |                                                                                                                                                             |                                                                                        |
|----------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------|---------------------------|-------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|          | 1                                                                                                                             | TELS                                                                                                                                                                  | È En                                                                                                                  | GINEER                                                                                 | ING                                                           | Phone: 770-       | -938-8233                 |             | *             |                                                                                                                                                             |                                                                                        |
|          |                                                                                                                               |                                                                                                                                                                       | So                                                                                                                    | ۲.                                                                                     |                                                               | Fax: 770-92       | 3-8973                    | A           |               |                                                                                                                                                             |                                                                                        |
|          |                                                                                                                               | $\Box$                                                                                                                                                                |                                                                                                                       | STS, LLC                                                                               | 5.                                                            | Web: <u>www.t</u> | est-llc.com               |             | 1.0 -18       |                                                                                                                                                             | •                                                                                      |
|          |                                                                                                                               |                                                                                                                                                                       |                                                                                                                       | ····                                                                                   |                                                               |                   | rkshe                     | et .        |               |                                                                                                                                                             |                                                                                        |
|          |                                                                                                                               |                                                                                                                                                                       |                                                                                                                       |                                                                                        |                                                               |                   |                           |             |               | I                                                                                                                                                           | <b></b>                                                                                |
|          |                                                                                                                               | BATCH-SA                                                                                                                                                              |                                                                                                                       | ·                                                                                      |                                                               | 13794/4-1         | <u> </u>                  |             | · · · ·       | BATCH#                                                                                                                                                      | 1                                                                                      |
|          | UMBER                                                                                                                         |                                                                                                                                                                       | 1230-02-1                                                                                                             | ·                                                                                      | LOCA                                                          | ATION             | Compos                    | ite Area A  | ,B,C,D        | MIXING TECH                                                                                                                                                 | RI/AV                                                                                  |
| PR. NA   | AME [                                                                                                                         | Former                                                                                                                                                                | North Plant MG                                                                                                        | P Site                                                                                 | SAMPLE TY                                                     | PE .              | ·                         | Mold        |               | BATCH DATE                                                                                                                                                  | 6/26/2012                                                                              |
| Time     | e Batch i                                                                                                                     | Mixing Star                                                                                                                                                           | ted                                                                                                                   |                                                                                        |                                                               |                   | ] .                       | Soi         | l Moistu      | re Mass, g                                                                                                                                                  | 3519.0                                                                                 |
|          |                                                                                                                               | Batch was N                                                                                                                                                           |                                                                                                                       |                                                                                        |                                                               |                   | ł                         |             |               | Content, %                                                                                                                                                  | 30.6                                                                                   |
|          |                                                                                                                               | Completely                                                                                                                                                            |                                                                                                                       |                                                                                        |                                                               |                   | 4                         |             |               | nent Used                                                                                                                                                   | I/II                                                                                   |
|          | - Satori                                                                                                                      | - singlotoly                                                                                                                                                          |                                                                                                                       |                                                                                        | L                                                             | ·                 | ہ<br>Grout V              |             |               | olids) Ratio*                                                                                                                                               | 0.80                                                                                   |
|          |                                                                                                                               |                                                                                                                                                                       | Mix                                                                                                                   | Constitue                                                                              | nts:                                                          | _                 |                           |             |               | ry Soil, g                                                                                                                                                  | 11500.0                                                                                |
| Compo    | onent                                                                                                                         | Com                                                                                                                                                                   | ponent                                                                                                                |                                                                                        | ount,                                                         |                   |                           | Total V     | Vater/Ce      | m. Mat. Ratio                                                                                                                                               | 4.675                                                                                  |
|          | ID                                                                                                                            | Na                                                                                                                                                                    | ame                                                                                                                   | % (based on<br>soil dry<br>mass)                                                       | g                                                             |                   |                           |             | Remar         | ks                                                                                                                                                          |                                                                                        |
| 13       | 3794                                                                                                                          | Soil                                                                                                                                                                  | (wet)                                                                                                                 | 100.0                                                                                  | 15019.0                                                       |                   |                           |             |               | added to make                                                                                                                                               |                                                                                        |
| 13       | 3823                                                                                                                          | GGBFS                                                                                                                                                                 | Grade 100                                                                                                             | 0.0                                                                                    | 0.0                                                           |                   |                           |             |               | added to make<br>e/moldable                                                                                                                                 | -                                                                                      |
| 13       | 3822                                                                                                                          | Cemen                                                                                                                                                                 | nt type I/II                                                                                                          | 8.0                                                                                    | 920.0                                                         |                   |                           |             |               |                                                                                                                                                             |                                                                                        |
|          | 0112                                                                                                                          |                                                                                                                                                                       | tonite                                                                                                                | 0.5                                                                                    | 57.5                                                          |                   |                           |             |               |                                                                                                                                                             |                                                                                        |
|          |                                                                                                                               |                                                                                                                                                                       |                                                                                                                       |                                                                                        |                                                               |                   | * Cementous<br>and cement | Materials ( | solids) is to | al mass of GGBFS,                                                                                                                                           | bentonite                                                                              |
|          |                                                                                                                               | Wat                                                                                                                                                                   | er, mL                                                                                                                | - 7                                                                                    | 82                                                            |                   |                           |             |               |                                                                                                                                                             | ×                                                                                      |
|          |                                                                                                                               |                                                                                                                                                                       | Required                                                                                                              | Nominal                                                                                | Mold Size                                                     | •                 | ( <u></u> -               |             | End Dr        | eparation                                                                                                                                                   |                                                                                        |
|          | Sampl                                                                                                                         | e ID                                                                                                                                                                  | Test                                                                                                                  |                                                                                        | Height, in.                                                   | Tamping<br>Tech   | Removal                   | Trim        | Method        | ·                                                                                                                                                           |                                                                                        |
|          |                                                                                                                               |                                                                                                                                                                       |                                                                                                                       | Diam., m.                                                                              | пеідпі, іп.<br>                                               | Tech              | Tech                      | Tech        | Internod      | Comr                                                                                                                                                        | nents                                                                                  |
|          |                                                                                                                               |                                                                                                                                                                       |                                                                                                                       |                                                                                        | 6.                                                            |                   |                           |             |               | A.C                                                                                                                                                         |                                                                                        |
|          | 13794-                                                                                                                        |                                                                                                                                                                       | MC                                                                                                                    | 3                                                                                      | <u> </u>                                                      | <u> </u>          | · · ·                     |             | <u> </u>      |                                                                                                                                                             | Mixing                                                                                 |
|          | 13794-                                                                                                                        | 4-1-2                                                                                                                                                                 | UCS                                                                                                                   | 3                                                                                      | 6                                                             |                   |                           |             |               | 7 di                                                                                                                                                        | ays                                                                                    |
|          | 13794-<br>13794-                                                                                                              | 4-1-2<br>4-1-3                                                                                                                                                        | UCS<br>UCS                                                                                                            | · · · ·                                                                                |                                                               |                   |                           |             |               | 7 di<br>14 c                                                                                                                                                | ays<br>lays                                                                            |
|          | 13794-4<br>13794-4<br>13794-4                                                                                                 | 4-1-2<br>4-1-3<br>4-1-4                                                                                                                                               | UCS                                                                                                                   | 3<br>3<br>3                                                                            | 6<br>6<br>6                                                   |                   |                           | ·           |               | 7 d<br>14 c<br>28 c                                                                                                                                         | ays<br>lays<br>lays                                                                    |
|          | 13794-4<br>13794-4<br>13794-4<br>13794-4                                                                                      | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5                                                                                                                                      | UCS<br>UCS<br>UCS<br>Perm                                                                                             | 3<br>3<br>3<br>3                                                                       | 6<br>6<br>6<br>3                                              |                   |                           |             |               | 7 d<br>14 d<br>28 d<br>7 d                                                                                                                                  | ays<br>lays<br>lays<br>ays                                                             |
|          | 13794-4<br>13794-4<br>13794-4<br>13794-4<br>13794-4                                                                           | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6                                                                                                                             | UCS<br>UCS<br>UCS<br>Perm<br>Perm                                                                                     | 3<br>3<br>3<br>3<br>3<br>3                                                             | 6<br>6<br>3<br>3                                              |                   |                           |             |               | 7 di<br>14 c<br>28 c<br>7 di<br>14 c                                                                                                                        | ays<br>lays<br>lays<br>ays<br>lays                                                     |
|          | 13794-4<br>13794-4<br>13794-4<br>13794-4                                                                                      | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6                                                                                                                             | UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm                                                                             | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                   | 6<br>6<br>3<br>3<br>3<br>3                                    |                   |                           |             |               | 7 d<br>14 d<br>28 d<br>7 d                                                                                                                                  | ays<br>lays<br>lays<br>ays<br>lays                                                     |
|          | 13794-4<br>13794-4<br>13794-4<br>13794-4<br>13794-4                                                                           | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-5<br>4-1-6<br>4-1-7                                                                                                           | UCS<br>UCS<br>UCS<br>Perm<br>Perm                                                                                     | 3<br>3<br>3<br>3<br>3<br>3                                                             | 6<br>6<br>3<br>3                                              |                   |                           |             |               | 7 di<br>14 c<br>28 c<br>7 di<br>14 c<br>28 c                                                                                                                | ays<br>lays<br>lays<br>ays<br>lays                                                     |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                                      | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-6<br>4-1-7<br>4-1-8                                                                                                  | UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm                                                                             | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                   | 6<br>6<br>3<br>3<br>3<br>3                                    |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>28 d<br>after 3                                                                                             | ays<br>lays<br>lays<br>ays<br>lays<br>lays                                             |
| <br><br> | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                            | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-9                                                                                         | UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration                                                              | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                              | 6<br>6<br>3<br>3<br>3<br>3<br>3                               |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>28 d<br>after 3                                                                                             | ays<br>lays<br>ays<br>ays<br>lays<br>lays<br>3 days<br>days ???                        |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                  | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-9<br>-(10-14)                                                                                      | UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1                                                   | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2                                              | 6<br>6<br>3<br>3<br>3<br>3<br>4                               |                   |                           |             |               | 7 di<br>14 d<br>28 d<br>7 di<br>14 d<br>28 d<br>28 d<br>after 3<br>after 28 d                                                                               | ays<br>lays<br>ays<br>lays<br>lays<br>3 days<br>days ???<br>5 28 days???               |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                        | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-9<br>-(10-14)<br>-(15-19)                                                                 | UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur                                               | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2                                         | 6<br>6<br>3<br>3<br>3<br>3<br>4<br>4                          |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>28 d<br>after 3<br>after 3<br>5 molds after                                                                 | ays<br>lays<br>ays<br>lays<br>lays<br>3 days<br>days ???<br>5 28 days???               |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-4-1                                     | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-5<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-9<br>-(10-14)<br>-(15-19)<br>I-1-20                                                       | UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.                                   | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2                               | 6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4                |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>28 d<br>after 3<br>after 3<br>after 28 d<br>5 molds after<br>5 molds after                                  | ays<br>lays<br>ays<br>lays<br>lays<br>3 days<br>days ???<br>5 28 days???               |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-4-1<br>13794-4-1                        | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-9<br>-(10-14)<br>-(10-14)<br>-(15-19)<br>H-1-20<br>H-1-21                                          | UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra.                         | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2                | 6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4           |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>28 d<br>after 3<br>after 3<br>after 28 d<br>5 molds after<br>5 molds after<br>UCS Spare<br>Perm Spare       | ays<br>lays<br>ays<br>lays<br>lays<br>3 days<br>days ???<br>5 28 days???               |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-4-1<br>13794-4<br>13794-4               | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-7<br>4-1-8<br>4-1-9<br>-(10-14)<br>-(15-19)<br>-(15-19)<br>-(15-19)<br>-(1-21<br>-(1-21)<br>-(1-22 | UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra                 | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>3                     | 6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>4<br>3 |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>28 d<br>after 3<br>after 3<br>after 28 d<br>5 molds after<br>5 molds after<br>UCS Spare<br>Perm Spare       | ays<br>lays<br>ays<br>lays<br>lays<br>days<br>days ???<br>r 28 days???<br>r 28 days??? |
|          | 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-4-1<br>13794-4-1<br>13794-4<br>13794-4<br>13794-4 | 4-1-2<br>4-1-3<br>4-1-4<br>4-1-5<br>4-1-6<br>4-1-7<br>4-1-8<br>4-1-7<br>4-1-8<br>4-1-9<br>-(10-14)<br>-(10-14)<br>-(15-19)<br>-1-20<br>-1-21<br>-1-22<br>-1-23        | UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra<br>Swell | 3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>3<br>3<br>3 | 6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>3<br>6 |                   |                           |             |               | 7 da<br>14 d<br>28 d<br>7 da<br>14 d<br>28 d<br>3 d<br>4 d<br>28 d<br>after 28 d<br>5 molds after<br>5 molds after<br>UCS Spare<br>Perm Spare<br>after 28 d | ays<br>lays<br>ays<br>lays<br>lays<br>days<br>days ???<br>r 28 days???<br>r 28 days??? |

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|                                                                                                        | TIMELY                                                                                                 |                                                                                          |                                                |                                                |                     | 1874 Forge Street Tucker, GA 30084                                          |                       |                                       |                                                                                                      |                                                                    |  |  |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------|---------------------|-----------------------------------------------------------------------------|-----------------------|---------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--|--|
|                                                                                                        | TE. ST ENGINEERING                                                                                     |                                                                                          |                                                |                                                | Phone: 770-938-8233 |                                                                             |                       |                                       |                                                                                                      |                                                                    |  |  |
|                                                                                                        | Soll                                                                                                   |                                                                                          |                                                |                                                | Phone: 770-938-8233 |                                                                             |                       |                                       |                                                                                                      |                                                                    |  |  |
|                                                                                                        |                                                                                                        |                                                                                          |                                                |                                                | AASH: 0 714         |                                                                             |                       |                                       |                                                                                                      |                                                                    |  |  |
|                                                                                                        |                                                                                                        |                                                                                          |                                                |                                                |                     |                                                                             | Web: www.test-lic.com |                                       |                                                                                                      |                                                                    |  |  |
|                                                                                                        |                                                                                                        |                                                                                          |                                                | Bat                                            | ch Wa               | orkshee                                                                     | et                    |                                       |                                                                                                      |                                                                    |  |  |
|                                                                                                        | BATCH-SAM                                                                                              | APLE ID                                                                                  |                                                |                                                | 13794/5-1           |                                                                             | ·                     |                                       | BATCH #                                                                                              | 1                                                                  |  |  |
| PR. NUMBER 1230-02-1                                                                                   |                                                                                                        |                                                                                          |                                                | LOCATION                                       |                     | Composite Area A,B,C,D                                                      |                       |                                       | MIXING TECH                                                                                          | RI/AV                                                              |  |  |
| PR. NAME                                                                                               | Former                                                                                                 | North Plant MG                                                                           | SAMPLE TYPE                                    |                                                | Mold                |                                                                             |                       | BATCH DATE                            | 6/26/2012                                                                                            |                                                                    |  |  |
| Time Batch                                                                                             | Mixing Stor                                                                                            | tod                                                                                      |                                                | ··· •                                          |                     |                                                                             | Soil                  | Moietur                               | o Marco d                                                                                            | 2510.0                                                             |  |  |
| Total Time I                                                                                           | -                                                                                                      |                                                                                          | . •                                            |                                                |                     |                                                                             |                       |                                       | re Mass, g 3519.0<br>Content, % 30.6                                                                 |                                                                    |  |  |
| Time Batch                                                                                             |                                                                                                        | -                                                                                        |                                                |                                                |                     | Soil Moisture                                                               |                       |                                       | · · · · · · · · · · · · · · · · · · ·                                                                |                                                                    |  |  |
|                                                                                                        | Completely                                                                                             | IT WOUS                                                                                  |                                                |                                                |                     | Grout W                                                                     | • •                   |                                       | nent Used ////<br>olids) Ratio*                                                                      |                                                                    |  |  |
|                                                                                                        |                                                                                                        | Mix                                                                                      | Constitue                                      | nts:                                           |                     | Gi yui II                                                                   |                       | ass of Di                             |                                                                                                      | 11500.0                                                            |  |  |
| Component                                                                                              |                                                                                                        |                                                                                          |                                                | ount,                                          |                     |                                                                             |                       |                                       | n. Mat. Ratio                                                                                        | * 104 A 391,00000 0481-0 6-04                                      |  |  |
|                                                                                                        | Name                                                                                                   |                                                                                          | % (based on                                    |                                                |                     | Pemerka                                                                     |                       |                                       |                                                                                                      |                                                                    |  |  |
| ID                                                                                                     | IN a                                                                                                   |                                                                                          | soil dry g<br>mass)                            |                                                |                     | Remarks                                                                     |                       |                                       |                                                                                                      |                                                                    |  |  |
| 13794                                                                                                  | Soil (wet)                                                                                             |                                                                                          | 100.0 <b>15019</b> .0                          |                                                |                     |                                                                             | ml of v               | vater was                             | added to make                                                                                        |                                                                    |  |  |
| 13823                                                                                                  | GGBFS                                                                                                  | Grade 100                                                                                | 0.0                                            | 0.0                                            |                     | 0 mL of water was added to make<br>soil/grout mixable/moldable              |                       |                                       |                                                                                                      |                                                                    |  |  |
| 13822 Cem                                                                                              |                                                                                                        | t type I/II                                                                              | 10.0                                           | 1150.0                                         |                     |                                                                             |                       |                                       |                                                                                                      |                                                                    |  |  |
| 10112                                                                                                  | Ben                                                                                                    | Bentonite                                                                                |                                                | 57.5                                           | 57.5                |                                                                             | 1: 4 - 2 - 4 - 4      | -1 6CODC                              | L                                                                                                    |                                                                    |  |  |
|                                                                                                        |                                                                                                        |                                                                                          | ř. ,                                           |                                                |                     | * Cementous Materials (solids) is total mass of GGBFS, bentonite and cement |                       |                                       |                                                                                                      | , bentonite                                                        |  |  |
|                                                                                                        | Wat                                                                                                    | er, mL                                                                                   | 966                                            |                                                |                     |                                                                             |                       |                                       |                                                                                                      |                                                                    |  |  |
| ſ                                                                                                      | Sample (D                                                                                              |                                                                                          | ired   Nominal M                               |                                                |                     | End Preparation                                                             |                       |                                       |                                                                                                      |                                                                    |  |  |
| Samp                                                                                                   |                                                                                                        |                                                                                          |                                                | Height, in.                                    | Tamping<br>Tech     | Removal<br>Tech                                                             | Trim<br>Tech          | Method                                |                                                                                                      | ments                                                              |  |  |
| 13794                                                                                                  | -5-1-1                                                                                                 | MC                                                                                       | 3                                              | 6                                              |                     |                                                                             |                       |                                       | After                                                                                                | Mixing                                                             |  |  |
| 13794                                                                                                  | -5-1-2                                                                                                 | UCS                                                                                      | 3                                              | 6                                              |                     |                                                                             |                       |                                       | 7 days                                                                                               |                                                                    |  |  |
| 13794                                                                                                  | -5-1-3                                                                                                 | UCS                                                                                      | 3                                              | 6                                              | Į                   |                                                                             |                       |                                       | 14 days                                                                                              |                                                                    |  |  |
| 13794-5-1-4                                                                                            |                                                                                                        | UCS                                                                                      | 3                                              | 6                                              |                     | L                                                                           |                       | L                                     | 28 days                                                                                              |                                                                    |  |  |
| 13794                                                                                                  | -0-1-4                                                                                                 | ·                                                                                        |                                                |                                                |                     |                                                                             |                       |                                       | 7 days                                                                                               |                                                                    |  |  |
|                                                                                                        | -5-1-5                                                                                                 | Perm                                                                                     | 3                                              | 3                                              |                     |                                                                             |                       |                                       | 70                                                                                                   | lays                                                               |  |  |
| 13794                                                                                                  |                                                                                                        |                                                                                          | 3                                              | 3                                              | )                   |                                                                             |                       |                                       | <u> </u>                                                                                             | days<br>days                                                       |  |  |
| 13794<br>13794                                                                                         | -5-1-5                                                                                                 | Perm                                                                                     | <u> </u>                                       | · · · · · ·                                    |                     |                                                                             |                       | · · · ·                               | 14                                                                                                   |                                                                    |  |  |
| 13794<br>13794<br>13794                                                                                | -5-1-5<br>-5-1-6                                                                                       | Perm<br>Perm                                                                             | 3                                              | 3                                              |                     |                                                                             |                       |                                       | 14<br>28                                                                                             | days                                                               |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794                                                              | -5-1-5<br>-5-1-6<br>-5-1-7                                                                             | Perm<br>Perm<br>Perm                                                                     | 3                                              | 3                                              |                     |                                                                             |                       |                                       | 14<br>28<br>after                                                                                    | days<br>days                                                       |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794                                                     | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8                                                                   | Perm<br>Perm<br>Perm<br>Penetration                                                      | 3<br>3<br>3                                    | 3<br>3<br>3                                    |                     |                                                                             |                       |                                       | 14<br>28<br>after<br>after 28                                                                        | days<br>days<br>3 days<br>days ???                                 |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794-5-                                                  | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8<br>-5-1-9                                                         | Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1                                           | 3<br>3<br>3<br>2                               | 3<br>3<br>3<br>4                               |                     |                                                                             |                       |                                       | 14<br>28<br>after<br>after 28<br>5 molds after                                                       | days<br>days<br>3 days<br>days ???<br>er 28 days??                 |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794-5-<br>13794-5-                                      | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8<br>-5-1-9<br>1-(10-14)                                            | Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur                                | 3<br>3<br>3<br>2<br>2                          | 3<br>3<br>3<br>4<br>4                          |                     |                                                                             |                       |                                       | 14<br>28<br>after<br>after 28<br>5 molds after                                                       | days<br>days<br>3 days<br>days ???<br>er 28 days??                 |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794-5-<br>13794-5-<br>13794-5-                          | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8<br>-5-1-9<br>1-(10-14)<br>1-(15-19)                               | Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.                    | 3<br>3<br>3<br>2<br>2<br>2<br>2                | 3<br>3<br>3<br>4<br>4<br>4<br>4                |                     |                                                                             |                       | · · · · · · · · · · · · · · · · · · · | 14<br>28<br>after<br>after 28<br>5 molds afte<br>5 molds afte                                        | days<br>days<br>3 days<br>days ???<br>er 28 days??                 |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794-5-<br>13794-5-<br>13794-<br>13794                   | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8<br>-5-1-9<br>1-(10-14)<br>1-(15-19)<br>5-1-20                     | Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra                   | 3<br>3<br>2<br>2<br>2<br>2<br>2<br>2           | 3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>4      |                     |                                                                             |                       |                                       | 14<br>28<br>after<br>after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare             | days<br>days<br>3 days                                             |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794-5-<br>13794-5-<br>13794-<br>13794<br>13794          | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8<br>-5-1-9<br>1-(10-14)<br>1-(15-19)<br>5-1-20<br>5-1-21           | Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra          | 3<br>3<br>2<br>2<br>2<br>2<br>2<br>3           | 3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>3      |                     |                                                                             |                       |                                       | 14<br>28<br>after<br>after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare             | days<br>days<br>3 days<br>days ???<br>er 28 days??<br>er 28 days?? |  |  |
| 13794<br>13794<br>13794<br>13794<br>13794<br>13794-5-<br>13794-5-<br>13794-<br>13794<br>13794<br>13794 | -5-1-5<br>-5-1-6<br>-5-1-7<br>-5-1-8<br>-5-1-9<br>1-(10-14)<br>1-(15-19)<br>5-1-20<br>5-1-21<br>5-1-22 | Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra<br>Swell | 3<br>3<br>2<br>2<br>2<br>2<br>2<br>3<br>3<br>3 | 3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>3<br>6 |                     |                                                                             |                       |                                       | 14<br>28<br>after<br>after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare<br>after 28 | days<br>days<br>3 days<br>days ???<br>er 28 days??<br>er 28 days?? |  |  |

|         |                                                                                       |                                                                                                    |                                                                          |                            |                       |                        |                                                                             | ۰.         |             |                                                                                 |                                          |  |
|---------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------|-----------------------|------------------------|-----------------------------------------------------------------------------|------------|-------------|---------------------------------------------------------------------------------|------------------------------------------|--|
|         |                                                                                       |                                                                                                    |                                                                          |                            |                       |                        | -                                                                           |            |             |                                                                                 |                                          |  |
| ſ       | <u> </u>                                                                              | ī                                                                                                  |                                                                          | MELY                       | <u> </u>              | 1874 Forge             | Street Tuck                                                                 | er. GA 300 | 184         |                                                                                 |                                          |  |
|         |                                                                                       | TES                                                                                                | * I                                                                      | GINEER                     | ING                   | Phone: 770             |                                                                             |            | *           |                                                                                 | ·                                        |  |
|         | ·                                                                                     |                                                                                                    | Sol                                                                      |                            |                       | Fax: 770-92            | 4                                                                           | A          |             |                                                                                 |                                          |  |
|         |                                                                                       | $\square$                                                                                          |                                                                          |                            |                       | Web: www.test-lic.com  |                                                                             |            |             |                                                                                 |                                          |  |
|         |                                                                                       |                                                                                                    |                                                                          |                            |                       | ·                      | orkshe                                                                      | et         |             |                                                                                 |                                          |  |
|         |                                                                                       | BATCH-SAM                                                                                          |                                                                          |                            | ····                  | 13794/6-1              |                                                                             | <u>.</u>   |             | BATCH#                                                                          | 1                                        |  |
| P       |                                                                                       |                                                                                                    |                                                                          | LOCATION                   |                       | Composite Area A,B,C,D |                                                                             |            | MIXING TECH | RI/AV                                                                           |                                          |  |
|         | R. NAME                                                                               | Former                                                                                             | North Plant MGP Site                                                     |                            | SAMPLE TYPE           |                        |                                                                             | Mold       | <u> </u>    | BATCH DATE                                                                      | 6/26/2012                                |  |
|         |                                                                                       |                                                                                                    |                                                                          |                            | •<br>                 |                        | ·                                                                           |            |             | , <u> </u>                                                                      |                                          |  |
|         | Time Batch I                                                                          | Mixing Star                                                                                        | ted                                                                      | · ·                        |                       |                        | ]                                                                           | Soi        | l Moistu    | ire Mass, g 3519.0                                                              |                                          |  |
|         | Total Time E                                                                          |                                                                                                    |                                                                          |                            |                       | <u> </u>               | Soil Moisture Content                                                       |            |             |                                                                                 | 30.6                                     |  |
|         | Time Batch                                                                            | Completely                                                                                         | in Molds                                                                 |                            | l                     |                        |                                                                             |            |             | Cement Used                                                                     |                                          |  |
|         |                                                                                       |                                                                                                    | Miv                                                                      | Constitue                  | nfs.                  |                        | GroutV                                                                      |            |             | olids) Ratio*<br>ry Soil, g                                                     | 0.80                                     |  |
| c       | omponent                                                                              | Com                                                                                                | ponent                                                                   |                            | ount,                 | 1                      |                                                                             |            |             | m. Mat. Ratio                                                                   |                                          |  |
| -       |                                                                                       |                                                                                                    |                                                                          | % (based on<br>soil dry    |                       | 1                      |                                                                             |            |             |                                                                                 |                                          |  |
|         | ١D                                                                                    | Na                                                                                                 | Name                                                                     |                            | g                     |                        |                                                                             |            | Remar       | KS                                                                              |                                          |  |
| _       | 13794 S                                                                               |                                                                                                    | (wet)                                                                    | 100.0                      | 15019.0               | }                      | 0 mL of water was added to make                                             |            |             |                                                                                 |                                          |  |
|         | 13823                                                                                 | GGBFS                                                                                              | GGBFS Grade 100                                                          |                            | 0.0                   |                        |                                                                             |            | e/moldable  | ·                                                                               |                                          |  |
|         | 13822                                                                                 | Cement type I/II                                                                                   |                                                                          | 8.0                        | 920.0                 |                        |                                                                             |            |             |                                                                                 |                                          |  |
|         | 10112                                                                                 | Bentonite                                                                                          |                                                                          | 1.0                        | 115.0                 |                        | * Cementous Materials (solids) is total mass of GGBFS, bentonite and cement |            |             |                                                                                 |                                          |  |
|         |                                                                                       |                                                                                                    |                                                                          | a din sahi at<br>Sa        |                       |                        |                                                                             |            |             |                                                                                 |                                          |  |
|         |                                                                                       | Wate                                                                                               | er, mL                                                                   | 828                        |                       |                        | End Dr                                                                      |            |             | reparation                                                                      |                                          |  |
| ļ       |                                                                                       |                                                                                                    | Pequired Nominal                                                         |                            | Mold Size             | · ·                    |                                                                             |            |             |                                                                                 |                                          |  |
|         | Sampl                                                                                 | le ID                                                                                              | Required<br>Test                                                         |                            | <u> </u>              | Tamping<br>Tech        | Removal                                                                     | Trim       | Method      |                                                                                 | mento                                    |  |
|         |                                                                                       |                                                                                                    |                                                                          |                            | Height, in.           | rech                   | Tech                                                                        | Tech       | Method      |                                                                                 | ments                                    |  |
|         | 13794-                                                                                |                                                                                                    | MC                                                                       | 3                          | 6                     |                        | ļ                                                                           |            | <b> </b>    | After Mixing                                                                    |                                          |  |
|         | 13794-                                                                                |                                                                                                    | UCS                                                                      | 3                          | 6                     |                        |                                                                             |            | <u> </u>    | 7 days                                                                          |                                          |  |
|         | 13794-                                                                                |                                                                                                    | UCS                                                                      | <u>3</u> .<br>3            | 6                     | <br>                   | ┞                                                                           |            | <u> </u>    | 14 days                                                                         |                                          |  |
| 13794-6 |                                                                                       |                                                                                                    |                                                                          |                            | 6                     | <u> </u>               |                                                                             |            | [           | 28 days<br>7 days                                                               |                                          |  |
|         | 13794-<br>13794-                                                                      |                                                                                                    | Perm<br>Perm                                                             | 3                          | 3                     |                        |                                                                             | · · · ·    |             |                                                                                 |                                          |  |
|         |                                                                                       | 0-1-0                                                                                              | Perm                                                                     | 3                          | 3                     |                        |                                                                             |            | · · ·       | 14 days                                                                         |                                          |  |
|         |                                                                                       | G 1 7                                                                                              |                                                                          |                            |                       |                        |                                                                             |            | <b> </b>    | 28 days<br>after 3 days                                                         |                                          |  |
|         | 13794-                                                                                |                                                                                                    |                                                                          | 3                          | 3                     |                        |                                                                             |            |             | after 28 days ???                                                               |                                          |  |
|         | 13794-<br>13794-                                                                      | 6-1-8                                                                                              | Penetration                                                              | . 3                        | 3                     |                        |                                                                             |            |             |                                                                                 |                                          |  |
|         | 13794-0<br>13794-0<br>13794-0                                                         | 6-1-8<br>6-1-9                                                                                     | Penetration<br>ANS16-1                                                   | 2                          | 4                     |                        |                                                                             |            |             | after 28                                                                        | days ???                                 |  |
|         | 137944<br>137944<br>137944<br>13794-6-1                                               | 6-1-8<br>6-1-9<br>-(10-14)                                                                         | Penetration<br>ANS16-1<br>Wet Dur                                        | 2<br>2                     | 4                     |                        |                                                                             |            |             | after 28<br>5 molds afte                                                        | days ???<br>r 28 days???                 |  |
|         | 137944<br>137944<br>137944<br>13794-6-1<br>13794-6-1                                  | 6-1-8<br>6-1-9<br>-(10-14)<br> -(15-19)                                                            | Penetration<br>ANS16-1                                                   | 2                          | 4                     |                        |                                                                             |            |             | after 28<br>5 molds afte<br>5 molds afte                                        | days ???                                 |  |
|         | 137944<br>137944<br>137944<br>13794-6-1                                               | 6-1-8<br>6-1-9<br>-(10-14)<br>-(15-19)<br>5-1-20                                                   | Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.                            | 2<br>2<br>2                | 4<br>4<br>4           |                        |                                                                             |            |             | after 28<br>5 molds afte                                                        | days ???<br>r 28 days???                 |  |
|         | 137944<br>137944<br>137944<br>13794-6-1<br>13794-6-1<br>13794-6-1                     | 6-1-8<br>6-1-9<br>-(10-14)<br>-(15-19)<br>5-1-20<br>5-1-21                                         | Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra                   | 2<br>2<br>2<br>2           | 4<br>4<br>4<br>4      |                        |                                                                             |            |             | after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare             | days ???<br>r 28 days???                 |  |
|         | 137944<br>137944<br>137944<br>13794-6-1<br>13794-6-1<br>13794-6<br>13794-6            | 6-1-8<br>6-1-9<br>-(10-14)<br>-(15-19)<br>5-1-20<br>5-1-21<br>5-1-22                               | Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra          | 2<br>2<br>2<br>2<br>2<br>3 | 4<br>4<br>4<br>4<br>3 |                        |                                                                             |            |             | after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare             | days ???<br>r 28 days???<br>r 28 days??? |  |
|         | 137944<br>137944<br>137944<br>13794-6-1<br>13794-6-1<br>13794-6<br>13794-6<br>13794-6 | 6-1-8<br>6-1-9<br>-(10-14)<br>-(15-19)<br>5-1-20<br>5-1-21<br>5-1-22<br>5-1-23<br>5-1-23<br>5-1-24 | Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.<br>Extra<br>Extra<br>Swell | 2<br>2<br>2<br>2<br>3<br>3 | 4<br>4<br>4<br>3<br>6 |                        |                                                                             |            |             | after 28<br>5 molds afte<br>5 molds afte<br>UCS Spare<br>Perm Spare<br>after 28 | days ???<br>r 28 days???<br>r 28 days??? |  |

| Г                               |                                                          |                      |                   | MELY                             |                       | 1874 Forge                            | Street Tucke                                                               | r, GA 300                             | 84              |                                      |               |  |  |
|---------------------------------|----------------------------------------------------------|----------------------|-------------------|----------------------------------|-----------------------|---------------------------------------|----------------------------------------------------------------------------|---------------------------------------|-----------------|--------------------------------------|---------------|--|--|
|                                 |                                                          | T.E. ST. ENGINEERING |                   |                                  | L                     | Phone: 770-938-8233                   |                                                                            |                                       |                 |                                      |               |  |  |
|                                 |                                                          |                      | Sol               |                                  | · 1                   | Fax: 770-92                           |                                                                            | A                                     |                 |                                      |               |  |  |
|                                 | TESTS, LLC                                               |                      |                   |                                  | Web: www.test-llc.com |                                       |                                                                            |                                       |                 |                                      |               |  |  |
| ┡                               |                                                          |                      |                   |                                  |                       |                                       |                                                                            |                                       | <u></u>         |                                      |               |  |  |
|                                 | Batch Worksheet                                          |                      |                   |                                  |                       |                                       |                                                                            |                                       |                 |                                      |               |  |  |
| BATCH-SAMPLE ID                 |                                                          |                      |                   |                                  | 13794/7-1             |                                       |                                                                            |                                       |                 | BATCH#                               |               |  |  |
| PR. NUMBER                      |                                                          |                      | 1230-02-1         |                                  | LOCATION              |                                       | Composite Area A,B,C,D                                                     |                                       | ,B,C,D          | MIXING TECH                          | RI/AV         |  |  |
| PR. NAME Former North Plant MGF |                                                          |                      |                   | P Site                           | SAMPLE TY             | PE                                    | <u> </u>                                                                   | Mold                                  |                 | BATCH DATE                           | 6/26/2012     |  |  |
|                                 |                                                          |                      |                   |                                  | •                     |                                       |                                                                            | Sail                                  | Maiatur         |                                      | 2540.0        |  |  |
|                                 | Time Batch Mixing Started<br>Total Time Batch was Mixed, |                      |                   |                                  |                       | <b>_</b>                              | Soil Moistu<br>Soil Moistur                                                |                                       |                 | re Mass, g 3519.0<br>Content, % 30.6 |               |  |  |
|                                 | Time Batch                                               |                      | -                 |                                  |                       |                                       |                                                                            |                                       | nent Used       | 30.8<br>1/11'                        |               |  |  |
|                                 | nine baten                                               | Completely           |                   | 1                                |                       | Grout Water/Cem. Mat                  |                                                                            |                                       |                 |                                      |               |  |  |
| Ľ                               |                                                          |                      | Mix               | Constitue                        | nts:                  |                                       |                                                                            |                                       | •               | ry Soil, g                           | 11500.0       |  |  |
| Ċ                               | omponent                                                 | Component            |                   | Amount,                          |                       |                                       |                                                                            | Total V                               | Vater/Ce        | <u>m. Mat. Ratio</u>                 | 3.940         |  |  |
|                                 | iD                                                       | Na                   | ame               | % (based on<br>soil dry<br>mass) | g                     |                                       | Remark                                                                     |                                       | ks              |                                      |               |  |  |
|                                 | 13794                                                    | Soil                 | (wet)             | 100.0                            | 15019.0               |                                       |                                                                            |                                       | inton was       | added to make                        |               |  |  |
| •                               | 13823                                                    |                      | Grade 100         | 0.0                              | 0.0                   |                                       |                                                                            |                                       |                 | s added to make                      |               |  |  |
| Ì –                             | 13822                                                    |                      | Cement type I/II_ |                                  | 1150.0                |                                       |                                                                            |                                       |                 |                                      |               |  |  |
|                                 | 10112                                                    | Bentonite            |                   | <u>    10.0</u><br>.     1.0 . , | 115.0                 |                                       |                                                                            |                                       |                 |                                      |               |  |  |
|                                 |                                                          |                      |                   |                                  |                       |                                       | * Cementous Materials (solids) is total mass of GGBFS, bento<br>and cement |                                       |                 | , bentonite                          |               |  |  |
| F                               | Wat                                                      |                      | er, mL            | 1012                             |                       |                                       |                                                                            |                                       |                 |                                      |               |  |  |
| F.                              |                                                          |                      |                   |                                  |                       |                                       |                                                                            |                                       |                 |                                      | ]             |  |  |
|                                 | Samp                                                     | ie iD                | Required<br>Test  |                                  | Mold Size             | Tamping                               | Removal                                                                    | Trim                                  | End Preparation |                                      |               |  |  |
|                                 | oump                                                     |                      | 1050              | Diam., in.                       | Height, in.           | Tech                                  | Tech                                                                       | Tech                                  | Method          | Com                                  | ments         |  |  |
|                                 | 13794                                                    | -7-1-1               | ĨМС               | 3                                | 6                     |                                       |                                                                            |                                       |                 | After                                | Mixing        |  |  |
|                                 | 13794                                                    | -7-1-2               | UCS               | 3                                | 6                     |                                       |                                                                            |                                       |                 | 7 days                               |               |  |  |
|                                 | 13794                                                    | 7-1-3                | UCS               | . 3                              | 6                     |                                       |                                                                            |                                       |                 | 14                                   | days          |  |  |
|                                 | 13794                                                    | -7-1-4               | UCS               | 3                                | 6                     |                                       |                                                                            |                                       | <u> </u>        | 28                                   | days          |  |  |
|                                 | 13794                                                    | -7-1-5               | Perm              | 3                                | 3                     | ·                                     |                                                                            | <u> </u>                              | <u> </u>        | 70                                   | lays          |  |  |
|                                 | 13794                                                    |                      | Perm              | 3                                | 3                     | ļ                                     |                                                                            |                                       | ļ               |                                      | days          |  |  |
|                                 | 13794-7-1-7                                              |                      | Perm              | 3                                | 3                     | ļ                                     |                                                                            |                                       |                 | · · · · ·                            | days          |  |  |
|                                 | 13794-7-1-8                                              |                      | Penetration       | 3                                | 3                     |                                       |                                                                            | · · · · · · · · · · · · · · · · · · · |                 | after 3 days                         |               |  |  |
|                                 | 13794-7-1-9                                              |                      | ANS16-1           | 2                                | 4                     |                                       |                                                                            |                                       | ·               | after 28 days ???                    |               |  |  |
|                                 | 13794-7-1-(10-14)                                        |                      | Wet Dur           | 2                                | 4                     |                                       |                                                                            |                                       | <u> </u>        | 5 molds after 28 days??              |               |  |  |
|                                 | 13794-7-1-(15-19)                                        |                      | Fr. Dur.          | 2                                | 4 .                   |                                       |                                                                            |                                       | <b> </b>        | <u> </u>                             | er 28 days??? |  |  |
|                                 | 13794-7-1-20                                             |                      | Extra             | 2                                | 4                     | · · · · · · · · · · · · · · · · · · · |                                                                            | <u> </u>                              | <b>_</b>        | UCS Spare                            |               |  |  |
|                                 | 13794-7-1-21                                             |                      | Extra             | 3                                | 3                     | · · ·                                 |                                                                            |                                       | <b> </b>        | Perm Spare                           |               |  |  |
|                                 | 13794-7-1-22                                             |                      | Swell             | 3                                | 6                     | ļ                                     |                                                                            |                                       | <u> </u>        | · · · ·                              | days ???      |  |  |
|                                 | 13794-7-1-23                                             |                      | Extra             | 2                                | 4                     |                                       |                                                                            |                                       | <u> </u>        | Extra UCS                            |               |  |  |
|                                 | 13794-7-1-24                                             |                      | Extra             | 3                                | 3                     |                                       |                                                                            |                                       |                 | Extra Perm                           |               |  |  |
| 11                              | 13794-7-1-(25-26)                                        |                      | Extra             |                                  | -                     | l                                     | I                                                                          |                                       | I               | Extra                                |               |  |  |

|                            | 1                                     |                         | MELY                 | · .         | 1874 Forge         | Street Tuck     | er, GA 300                                   |                |                             |                   |
|----------------------------|---------------------------------------|-------------------------|----------------------|-------------|--------------------|-----------------|----------------------------------------------|----------------|-----------------------------|-------------------|
|                            | TELS                                  | <u>r</u> En             | GINEER               | ING         | -<br>Phone: 770    | -938-8233       |                                              | *              |                             |                   |
|                            |                                       | <b>S</b> 01             |                      |             | Fax: 770-92        | 23-8973         |                                              | T THE DY       |                             |                   |
|                            |                                       | Те                      | STS, LLC             | 3           | Web: <u>www.</u> f | test-llc.com    |                                              |                |                             |                   |
|                            |                                       |                         |                      | Bat         | tch Wo             | orkshe          | et                                           |                |                             |                   |
|                            | BATCH-SAI                             | MPLE ID                 | -                    |             | 13794/8-1          | 1               |                                              |                | BATCH#                      | 1                 |
| PR. NUMBER                 |                                       | 1230-02-1               |                      | LOCA        | ATION              | Compos          | site Area A                                  | ,B,C,D         | MIXING TECH                 | RI/AV             |
| PR. NAME                   | Former                                | North Plant MG          | P Site               | SAMPLE TY   | PE                 |                 | Mold                                         |                | BATCH DATE                  | 6/28/201          |
|                            |                                       | ·                       |                      |             |                    | <br>]           |                                              |                | Г                           |                   |
| Time Batch                 | -                                     |                         |                      |             |                    |                 |                                              |                | re Mass, g                  | 3519.0            |
| Total Time I               |                                       |                         |                      |             |                    |                 |                                              |                | Content, %                  | 30.6              |
| Time Batch                 | Completely                            | n Molds                 | . ·                  |             |                    | ]<br>Grout V    |                                              |                | nent Used<br>olids) Ratio*  | /  <br>••••••0.80 |
|                            |                                       | Mix                     | Constitue            | nts:        |                    |                 |                                              |                | ry Soil, g                  | 11500.            |
| Component                  | Com                                   | ponent                  |                      | ount,       | 1                  |                 |                                              |                | m. Mat. Ratio               | 5.967             |
| ID                         | <sup>1</sup> N                        | ame                     | % (based on soil dry | g           |                    |                 |                                              | Remar          | ks                          |                   |
| ,13794                     | Soil                                  | (wet)                   | mass)<br>100.0       | 15019.0     |                    | <u> </u>        |                                              | <u> </u>       |                             |                   |
| 13823                      |                                       | Grade 100               | 4.5                  | 517.5       |                    |                 |                                              |                | added to make<br>e/moldable |                   |
| 13822                      |                                       |                         |                      |             |                    | ·               | <u></u>                                      |                |                             |                   |
|                            |                                       | nt type 1/11<br>ntonite | 1.5                  | 172.5       |                    |                 |                                              |                |                             |                   |
| 10112                      | Ber                                   |                         | 0.5                  | 57.5        |                    |                 | Materials (                                  | solids) is tot | al mass of GGBFS, b         | entonite          |
| <u> </u>                   | · · · · · ·                           |                         |                      | <u> </u>    |                    | and cement      |                                              |                |                             |                   |
|                            | vvat                                  | er, mL                  | 5                    | 98          |                    |                 | <u> </u>                                     |                |                             |                   |
|                            |                                       | Required                | Nominal              | Mold Size   | Tamping            |                 |                                              | End Pre        | eparation                   |                   |
| Samp                       | le ID                                 | Test                    | Diam., in.           | Height, in. | Tech               | Removal<br>Tech | Trim<br>Tech                                 | Method         | Comm                        | ents              |
| 13794                      | -8-1-1                                | MC                      | 3                    | 6           |                    | i ieun          |                                              | <u> </u>       | After M                     | ixing             |
| 13794                      |                                       | UCS                     | 3                    | 6           |                    |                 |                                              | <u> </u>       | 7 da                        |                   |
| 13794                      |                                       | UCS                     | 3                    | 6           |                    |                 |                                              |                | 14 da                       | · · · ·           |
| 13794                      |                                       | UCS                     | 3                    | 6           |                    |                 |                                              |                | 28 da                       |                   |
| 13794                      |                                       | Perm                    | 3                    | 3           | (                  | 1               |                                              | 1              | 7 da                        | ys                |
| 13794                      | -8-1-6                                | Perm                    | 3                    | 3           |                    | 1               |                                              |                | 14 da                       | iys               |
| 13794                      | -8-1-7                                | Perm                    | 3                    | 3           | 7                  |                 |                                              |                | 28 da                       | iys               |
| 13794                      | - <b>8-1</b> -8                       | Penetration             | 3                    | 3           |                    |                 |                                              |                | after 3                     | days              |
| 13794                      | -8-1-9                                | ANS16-1                 | 2                    | 4           | ]                  | · ·             |                                              |                | after 28 da                 | ays ???           |
| 13794-8-                   | 1-(10-14)                             | Wet Dur                 | 2                    | 4           |                    |                 |                                              |                | 5 molds after :             | 28 days?          |
| 13794-8-                   | 1-(15-19)                             | Fr. Dur.                | 2                    | 4           |                    |                 |                                              |                | 5 molds after :             | 28 days?1         |
| 13794-                     |                                       | Extra                   | 2                    | 4           |                    |                 |                                              | <u> </u>       | UCS Spare                   |                   |
| 10001                      | 8-1-21                                | Extra                   | 3                    | 3           |                    | ļ               |                                              |                | Perm Spare                  |                   |
|                            |                                       | Swell                   | 3                    | 6           | <b> </b>           |                 | <u>                                     </u> |                | after 28 da                 | ays ???           |
| 13794-                     | 8-1-23                                | Extra                   | 2                    | 4           |                    | <b> </b>        |                                              | ļ              | Extra UCS                   |                   |
| 13794-<br>13794-           | · · · · · · · · · · · · · · · · · · · |                         | 3                    | 3.          | I .                |                 |                                              | Ļ              | Extra Perm                  |                   |
| 13794-<br>13794-<br>13794- | 8-1-24                                | Éxtra                   |                      |             |                    |                 | 1                                            |                | C. A.                       |                   |
| 13794-<br>13794-           | 8-1-24                                | Extra                   | -                    | -           |                    |                 |                                              |                | Extra                       |                   |
| 13794-<br>13794-<br>13794- | 8-1-24                                |                         |                      |             |                    |                 | <br>                                         |                | Extra                       |                   |

| Γ  |                                                              |             |             |                                  | 1874 Forge Street Tucker, GA 30084 Phone: 770-938-8233 |                             |                              |                |                   |                   |              |  |
|----|--------------------------------------------------------------|-------------|-------------|----------------------------------|--------------------------------------------------------|-----------------------------|------------------------------|----------------|-------------------|-------------------|--------------|--|
| [  |                                                              |             | E EN<br>Sol |                                  | ,                                                      | Phone: 770-<br>Fax: 770-92: |                              | A              |                   |                   |              |  |
|    |                                                              | $\Delta$    |             | STS, LLC                         | 1                                                      | Web: www.te                 |                              | 7.61           | U and C           |                   |              |  |
| ┝  |                                                              |             |             |                                  |                                                        |                             |                              |                |                   | · <del></del>     |              |  |
|    | Batch Worksheet                                              |             |             |                                  |                                                        |                             |                              |                |                   |                   |              |  |
|    |                                                              | BATCH-SAN   | APLE ID     | · .                              |                                                        | 13794/9-1                   |                              |                |                   | BATCH #           | 1            |  |
|    | R. NUMBER                                                    |             | 1230-02-1   |                                  | LOCA                                                   | TION                        | Composi                      | te Area, A     | ,B,C,D            | MIXING TECH       | RI/AV        |  |
| PF | PR. NAME Former North Plant MGP Site SAMPLE T                |             |             |                                  |                                                        | PE                          |                              | Mold           |                   | BATCH DATE        | 6/28/2012    |  |
|    | Time Batch                                                   | Miving Stad | tad         | <u> </u>                         |                                                        |                             |                              | Soil           | Moistur           | e Mass, g         | 3519.0       |  |
| 1  | Time Batch Mixing Started<br>Total Time Batch was Mixed, min |             |             |                                  |                                                        | · · · · · ·                 | • •                          |                |                   | Content, %        | 30.6         |  |
| 1  | Time Batch                                                   | ·           |             | 1                                | ·                                                      |                             |                              |                |                   | ient Used         |              |  |
|    |                                                              |             |             |                                  | L                                                      |                             | Grout W                      |                |                   | olids) Ratio*     | 0.80         |  |
|    |                                                              |             |             | Constitue                        | nts:                                                   |                             |                              | Ma             | ass of Dr         | y Soil, g         | 11500.0      |  |
| Ce | omponent                                                     | Com         | ponent      |                                  | ount,                                                  | l r                         |                              | Total V        | Vater/Ce          | m. Mat. Ratio     | 4.675        |  |
|    | ID                                                           | Na          | ame         | % (based on<br>soil dry<br>mass) | g                                                      |                             |                              |                | Remark            | (S                | · .          |  |
|    | 13794                                                        | Soil        | (wet)       | 100.0                            | 15019.0                                                |                             | 0                            | mL of w        | vater was         | added to make     |              |  |
|    | 13823                                                        | GGBFS       | Grade 100   | 6.0                              | 690.0                                                  |                             | soil/grout mixab             |                |                   |                   |              |  |
|    | 13822                                                        | Cemen       | t type I/II | 2.0                              | 230.0                                                  |                             |                              |                |                   | ·                 |              |  |
|    | 10112 Bentonite                                              |             | 0.5         | 57.5                             |                                                        | * Camantour                 | Materiola (                  | solida) in tot | al mass of GGBFS, | hentonite         |              |  |
|    |                                                              |             |             |                                  |                                                        |                             | and cement                   | materiais (    | 301103/35/101     | ai mass of OODF3, |              |  |
|    |                                                              | Wate        | er, mL`     | 7                                | 82                                                     |                             |                              |                |                   |                   |              |  |
|    |                                                              |             | Required    | Nominal                          | Mold Size                                              |                             | End Preparation              |                |                   |                   |              |  |
|    | Samp                                                         | le iD       | Test        |                                  | Height, in.                                            | Tamping<br>Tech             | Removal Trim Method Comments |                |                   |                   | nents        |  |
|    | 40704                                                        | 0.4.4       | MC          | 3                                | 6                                                      |                             | Tech                         | Tech           | }                 | After             | Mixing       |  |
|    | 13794<br>13794                                               |             | UCS         | 3                                | 6                                                      |                             |                              |                |                   |                   | ays          |  |
|    | 13794                                                        |             | UCS         | 3                                | 6                                                      | <u> `-</u>                  |                              |                | +                 |                   | lays         |  |
|    | 13794                                                        |             | UCS         | 3                                | 6                                                      | <u> </u>                    | · · · ·                      |                | <u> </u>          | [                 | tays         |  |
|    | 13794                                                        |             | Perm        | 3                                | 3                                                      |                             | · · · · ·                    | ·              | <u>├</u>          |                   | ays          |  |
|    | 13794                                                        |             | Perm        | 3                                | 3                                                      |                             |                              |                | 1                 |                   | lays         |  |
|    | 13794                                                        |             | Perm        | 3                                | 3                                                      |                             |                              |                |                   | <u> </u>          | lays         |  |
|    | 13794                                                        |             | Penetration | 3                                | 3                                                      |                             |                              |                | T                 |                   | 3 days       |  |
|    | 13794                                                        |             | ANS16-1     | 2                                | 4                                                      |                             |                              |                |                   | after 28          | days ???     |  |
|    | 13794-9-1                                                    | 1-(10-14)   | Wet Dur     | 2                                | 4                                                      |                             |                              |                |                   | 5 molds afte      | r 28 days??? |  |
|    | 13794-9-                                                     | 1-(15-19)   | Fr. Dur.    | 2                                | 4                                                      |                             |                              |                |                   | 5 molds afte      | r 28 days??? |  |
|    | 13794-                                                       | 9-1-20      | Extra       | 2                                | • 4                                                    |                             |                              |                |                   | UCS Spare         |              |  |
|    | 13794-                                                       | 9-1-21      | Extra       | 3                                | 3                                                      | ļ                           | <br>                         |                | .<br>             | Perm Spare        |              |  |
|    | 13794-                                                       |             | Swell       | 3                                | 6                                                      |                             |                              |                | <b> </b>          | ·····             | days ???     |  |
|    | 13794-                                                       |             | Extra       | 2                                | 4                                                      | ļ                           |                              |                |                   | Extra UCS         |              |  |
|    | 13794-                                                       |             | Extra       | 3                                | . 3                                                    | <b> </b>                    |                              | <br>           |                   | Extra Perm        |              |  |
|    | 13794-9-                                                     | 1-(25-26)   | Extra       |                                  | -                                                      |                             | [                            |                |                   | Extra             |              |  |

|                                                                                                                                                      |                                                                                                                                                                                |                                                                                                                                            |                                                                                                                                |                                                                                                          |                                       |                                              |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | )                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                      |                                                                                                                                                                                |                                                                                                                                            | MELY                                                                                                                           | ·                                                                                                        | 1874 Force                            | Street Tucke                                 | er GA 300    | 084           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | · · · · · · · · · · · · · · · · · · ·                                                                             |
|                                                                                                                                                      | TELS                                                                                                                                                                           | ÷                                                                                                                                          | GINEER                                                                                                                         | ING                                                                                                      | Phone: 770                            |                                              |              | *             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
|                                                                                                                                                      |                                                                                                                                                                                | So:                                                                                                                                        |                                                                                                                                |                                                                                                          | Fax: 770-92                           |                                              | A            |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
|                                                                                                                                                      | $\Delta$                                                                                                                                                                       |                                                                                                                                            | STS, LLC                                                                                                                       | r,                                                                                                       | Web: www.                             |                                              | 7024         | rg fit.       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
|                                                                                                                                                      |                                                                                                                                                                                |                                                                                                                                            |                                                                                                                                |                                                                                                          |                                       | rkshe                                        | et           |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
|                                                                                                                                                      | BATCH-SAM                                                                                                                                                                      |                                                                                                                                            |                                                                                                                                |                                                                                                          | 13794/10-                             | 1                                            |              |               | BATCH#                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                   |
| PR. NUMBER                                                                                                                                           |                                                                                                                                                                                | 1230-02-1                                                                                                                                  |                                                                                                                                | LOCA                                                                                                     | ATION                                 | Compos                                       | ite Area A   | ,B,C,D        | MIXING TECH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | RI/AV                                                                                                             |
| PR. NAME                                                                                                                                             | Former                                                                                                                                                                         | North Plant MG                                                                                                                             | P Site                                                                                                                         | SAMPLE TY                                                                                                | PE                                    |                                              | Mold         | <u> </u>      | BATCH DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6/28/2012                                                                                                         |
|                                                                                                                                                      |                                                                                                                                                                                |                                                                                                                                            |                                                                                                                                |                                                                                                          | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · ·        |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
| Time Batch                                                                                                                                           | Mixing Star                                                                                                                                                                    | ted                                                                                                                                        |                                                                                                                                |                                                                                                          |                                       |                                              | Soi          | l Moistu      | re Mass, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3519.0                                                                                                            |
| Total Time E                                                                                                                                         | Batch was N                                                                                                                                                                    | lixed, min                                                                                                                                 |                                                                                                                                |                                                                                                          |                                       |                                              | Soil I       | Moisture      | Content, %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 30.6                                                                                                              |
| Time Batch                                                                                                                                           | Completely                                                                                                                                                                     | in Molds                                                                                                                                   |                                                                                                                                | l                                                                                                        |                                       | 1                                            |              |               | nent Used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <u>I</u> /II                                                                                                      |
|                                                                                                                                                      |                                                                                                                                                                                | МЛ?                                                                                                                                        | Constitue                                                                                                                      |                                                                                                          |                                       | Grout V                                      |              |               | olids) Ratio*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.80                                                                                                              |
| Component                                                                                                                                            | Com                                                                                                                                                                            | ponent                                                                                                                                     |                                                                                                                                | ount,                                                                                                    | 1                                     |                                              |              |               | ry Soil, g<br>m. Mat. Ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11500.0<br>3.900                                                                                                  |
| - sinponent                                                                                                                                          |                                                                                                                                                                                | -                                                                                                                                          | % (based on                                                                                                                    | 1                                                                                                        | 1                                     | <u> </u>                                     |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
| ١D                                                                                                                                                   | Ni                                                                                                                                                                             | ame                                                                                                                                        | soil dry<br>mass)                                                                                                              | 9                                                                                                        | }                                     | Remarks                                      |              |               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                   |
| 13794                                                                                                                                                | Soil                                                                                                                                                                           | (wet)                                                                                                                                      | 100.0                                                                                                                          | 15019.0                                                                                                  | 1                                     |                                              |              |               | addad ta maka                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                   |
| 13823                                                                                                                                                |                                                                                                                                                                                | Grade 100                                                                                                                                  | 7.5                                                                                                                            | 862.5                                                                                                    |                                       | 0 mL of water was ad<br>soil/grout mixable/m |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
| 13822                                                                                                                                                | Cemen                                                                                                                                                                          | t type I/II                                                                                                                                | 2.5                                                                                                                            | 287.5                                                                                                    |                                       |                                              |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
| 10112                                                                                                                                                |                                                                                                                                                                                | tonite                                                                                                                                     | 0.5                                                                                                                            | 57.5                                                                                                     | 1                                     |                                              |              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
|                                                                                                                                                      |                                                                                                                                                                                |                                                                                                                                            | ·                                                                                                                              | 1                                                                                                        | 1                                     |                                              |              |               | 1 . SCCDER I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11                                                                                                                |
|                                                                                                                                                      |                                                                                                                                                                                |                                                                                                                                            | 1.00                                                                                                                           | 1                                                                                                        | 1                                     |                                              | Materials (  | solids) is to | al mass of GGBFS, I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | benionite                                                                                                         |
|                                                                                                                                                      | Wat                                                                                                                                                                            | er. ml                                                                                                                                     |                                                                                                                                | 66                                                                                                       |                                       | * Cementous<br>and cement                    | Materials (  | solids) is to | al mass of GOBFS, (                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | bentonite                                                                                                         |
|                                                                                                                                                      | Wat                                                                                                                                                                            | er, mL                                                                                                                                     | 9                                                                                                                              | 66                                                                                                       |                                       |                                              | Materials (  |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                   |
| Samo                                                                                                                                                 |                                                                                                                                                                                | Required                                                                                                                                   | 9<br>Nominal                                                                                                                   | Mold Size                                                                                                | Tamping                               | and cement                                   |              | End Pro       | eparation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                   |
| Samp                                                                                                                                                 |                                                                                                                                                                                | · · · · · · · · · · · · · · · · · · ·                                                                                                      | 9<br>Nominal                                                                                                                   |                                                                                                          |                                       | and cement                                   | Trim         |               | eparation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                   |
| . Samp<br>13794-                                                                                                                                     | ile ID                                                                                                                                                                         | Required                                                                                                                                   | 9<br>Nominal                                                                                                                   | Mold Size                                                                                                |                                       | and cement                                   |              | End Pro       | eparation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | nents                                                                                                             |
|                                                                                                                                                      | <b>ile ID</b><br>10-1-1                                                                                                                                                        | Required<br>Test                                                                                                                           | 9<br>Nominal<br>Diam., in.                                                                                                     | Mold Size<br>Height, in.                                                                                 |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | nents                                                                                                             |
| 13794-1                                                                                                                                              | <b>ie ID</b><br>10-1-1<br>10-1-2                                                                                                                                               | Required<br>Test<br>MC                                                                                                                     | 9<br>Nominal<br>Diam., in.<br>3                                                                                                | Mold Size<br>Height, in.<br>6                                                                            |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | nents<br>Aixing<br>ays                                                                                            |
| 13794-<br>13794-                                                                                                                                     | le ID<br>10-1-1<br>10-1-2<br>10-1-3                                                                                                                                            | Required<br>Test<br>MC<br>UCS                                                                                                              | 9<br>Nominal<br>Diam., in.<br>3<br>3                                                                                           | Mold Size<br>Height, in.<br>6<br>6                                                                       |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M<br>7 da                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | nents<br>Aixing<br>ays<br>ays                                                                                     |
| 13794-<br>13794-<br>13794-                                                                                                                           | <b>ie ID</b><br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-4                                                                                                                           | Required<br>Test<br>MC<br>UCS<br>UCS                                                                                                       | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3                                                                                      | Mold Size<br>Height, in.<br>6<br>6<br>6<br>6<br>3                                                        |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 da                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | nents<br>Aixing<br>ays<br>ays<br>ays                                                                              |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                                                   | <b>ie ID</b><br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-6                                                                                                       | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm                                                                                | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                             | Mold Size<br>Height, in.<br>6<br>6<br>6<br>6                                                             |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 di<br>28 di<br>7 da<br>14 di                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | nents<br>Mixing<br>ays<br>ays<br>ays<br>ays<br>ays                                                                |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                                         | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-6<br>10-1-7                                                                                                    | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm                                                                        | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                                   | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3                                              |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 da<br>28 da<br>7 da<br>14 da<br>28 da                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | nents<br>Aixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays                                                  |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                               | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-6<br>10-1-7<br>10-1-8                                                                                          | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm                                                                | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3                                    | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>3                                         |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 da<br>28 da<br>7 da<br>14 da<br>14 da<br>28 da<br>28 da<br>28 da                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | nents<br>Mixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays                             |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-                                                               | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-6<br>10-1-7<br>10-1-8<br>10-1-9                                                                                | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1                                      | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2                                              | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>3<br>4                                    |                                       | and cement                                   | Trim<br>Tech | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 da<br>28 da<br>7 da<br>14 da<br>28 da<br>28 da<br>34 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>28 da<br>29 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 da<br>20 | nents<br>Aixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>days<br>days ???                              |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-10-                                        | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-3<br>10-1-5<br>10-1-5<br>10-1-5<br>10-1-7<br>10-1-8<br>10-1-9<br>1-(10-14)                                                         | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur                           | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2                                              | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>3<br>4<br>4<br>4                          |                                       | and cement                                   | Trim         | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 da<br>28 da<br>14 da<br>28 da<br>14 da<br>28 da<br>after 3<br>after 28 da<br>5 molds after                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | nents<br>Aixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>days<br>days ???<br>28 days???                       |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-10-<br>13794-10-                                     | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-5<br>10-1-6<br>10-1-7<br>10-1-8<br>10-1-9<br>1-(10-14)<br>1-(15-19)                                            | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm<br>Penetration<br>ANS16-1<br>Wet Dur<br>Fr. Dur.               | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2                               | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4                     |                                       | and cement                                   | Trim<br>Tech | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 di<br>28 di<br>28 di<br>14 di<br>28 di<br>28 di<br>3 after 3<br>after 28 di<br>5 molds after<br>5 molds after                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | nents<br>Aixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>days<br>days<br>28 days???                           |
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| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-10-<br>13794-10-<br>13794-10-<br>13794-1<br>13794-1            | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-3<br>10-1-5<br>10-1-5<br>10-1-5<br>10-1-7<br>10-1-8<br>10-1-7<br>10-1-9<br>1-(10-14)<br>1-(15-19)<br>10-1-20<br>10-1-21            | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Fr. Dur.<br>Extra<br>Extra          | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>3                | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>4<br>4<br>3      |                                       | and cement                                   | Trim<br>Tech | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 di<br>28 di<br>28 di<br>7 da<br>14 di<br>28 di<br>3 difer 3<br>after 3<br>after 28 di<br>5 molds after<br>5 molds after<br>UCS Spare<br>Perm Spare                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | nents<br>Mixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>days<br>days<br>lays ???<br>28 days???<br>28 days??? |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-10-<br>13794-10-<br>13794-10-<br>13794-1<br>13794-1<br>13794-1 | Je ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-5<br>10-1-6<br>10-1-7<br>10-1-8<br>10-1-9<br>1-(10-14)<br>1-(15-19)<br>10-1-20<br>10-1-21<br>10-1-22 | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Fr. Dur.<br>Extra<br>Extra<br>Swell | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>3<br>3<br>3 | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>4<br>4<br>5<br>6 |                                       | and cement                                   | Trim<br>Tech | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 da<br>28 da<br>7 da<br>14 da<br>28 da<br>28 da<br>14 da<br>28 da<br>14 da<br>28 da<br>3 fter 3<br>after 28 da<br>5 molds after<br>UCS Spare<br>Perm Spare<br>after 28 da                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | nents<br>Mixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>days<br>days<br>lays ???<br>28 days???<br>28 days??? |
| 13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-<br>13794-10-<br>13794-10-<br>13794-10-<br>13794-1<br>13794-1            | le ID<br>10-1-1<br>10-1-2<br>10-1-3<br>10-1-3<br>10-1-4<br>10-1-5<br>10-1-5<br>10-1-6<br>10-1-7<br>10-1-8<br>10-1-9<br>1-(10-14)<br>1-(15-19)<br>10-1-20<br>10-1-21<br>10-1-23 | Required<br>Test<br>MC<br>UCS<br>UCS<br>UCS<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Perm<br>Fr. Dur.<br>Extra<br>Extra          | 9<br>Nominal<br>Diam., in.<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>3<br>2<br>2<br>2<br>2<br>2<br>2<br>2<br>3                | Mold Size<br>Height, in.<br>6<br>6<br>6<br>3<br>3<br>3<br>3<br>4<br>4<br>4<br>4<br>4<br>4<br>4<br>3      |                                       | and cement                                   | Trim<br>Tech | End Pro       | eparation<br>Comm<br>After M<br>7 da<br>14 di<br>28 di<br>28 di<br>7 da<br>14 di<br>28 di<br>3 difer 3<br>after 3<br>after 28 di<br>5 molds after<br>5 molds after<br>UCS Spare<br>Perm Spare                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | nents<br>Mixing<br>ays<br>ays<br>ays<br>ays<br>ays<br>ays<br>days<br>days<br>lays ???<br>28 days???               |

# APPENDIX B2

# MATERIAL DATA SHEETS AND MILL TEST REPORTS

| Ĩ      |                                                                                                                                                                                                                                                                                    | ۰<br>-   |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|        | LAFARGE<br>NORTH AMERICA                                                                                                                                                                                                                                                           |          |
|        | South Chicago Plant<br>Grade 100 Newcem<br>MILL TEST CERTIFICATE - <b>NewCem</b>                                                                                                                                                                                                   |          |
|        | Reference Results Test Results                                                                                                                                                                                                                                                     | <b>-</b> |
|        | Fineness:         Fineness:           Blaine         Blaine           (cm²/g)3645*         (cm²/g)5.215           45 micron         45 micron           retained (%)6*         retained (%)0.5                                                                                     |          |
|        | Compressive Strength (PSI)       Compressive Strength (PSI)         Actual       Limit       7 Day       4,340         7 Day       4,853       na       28 Day**       6,075                                                                                                       |          |
|        | 28 Day**         5,394         5,000 minimum         Slag Activity Index (%):         Actual         Limit           CHEMICAL         7 Day         89         75 minimum           Actual         Limit         1                                                                 |          |
|        | Na2OEOUV         28 Day**         113         95 minimum           (%)         0.83*         0.6 to 0.9         Actual         Limit           Sample Identification         Air Content, (%)         5.5         12           Sample#         na         S.G. NewCem         2.98 | -        |
| ,<br>, | March 2012<br>Mill Run Composite                                                                                                                                                                                                                                                   |          |
|        | Actual Limit<br>Sulfide Sulfur (S), (%) 1.05 2.5 maximum                                                                                                                                                                                                                           |          |
|        | SO3 (%)         0.00         4.0 maximum           * Predetermined value         Chlorides (%)         0.022           ** Results for November 2011         Chlorides (%)         0.022                                                                                            |          |
|        | We hereby certify that the slag represented by the above chemical and physical analysis<br>meets the requirements of ASTM C989, AASHTO M-302 for<br>Grade 100 Ground Granulated Blast-Furnace Slag (GGBFS).                                                                        |          |
|        | Great Lakes Region<br>South Chicago Plant<br>2150 E. 130th St., Chicago, IL 60633<br>Telephone (773) 646-3150<br>Date                                                                                                                                                              |          |
|        |                                                                                                                                                                                                                                                                                    |          |



### **CEMENT MILL TEST REPORT**

#### Cement

| ORTH AMERICA                                                   |          |                                                  | (NSE)                       |
|----------------------------------------------------------------|----------|--------------------------------------------------|-----------------------------|
| Cement                                                         |          |                                                  | Certified to<br>NSF/ANSI 61 |
| CONSIGNEE:                                                     |          | Date:                                            | June '12                    |
| CONSIGNED.                                                     |          | Plant:                                           | ALPENA                      |
|                                                                |          | Cement Type:                                     | I-11                        |
| · · · · · · · · · · · · · · · · · · ·                          | <u> </u> | Manufacture Period:                              | May '12                     |
| PHYSICAL DATA                                                  |          | CHEMICAL DATA (C-114)                            | Percent                     |
| Specific Surface (Blaine) (C-204)                              |          | Silicon Dioxide (SiO <sub>2</sub> )              | 19.7                        |
| (sq. cm./gm.)                                                  |          |                                                  |                             |
| (sq. m./kg.)                                                   | 370      | Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ) | 4.8                         |
| Percent Passing 45 µm (C-430)                                  | 97.0     | Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> )   | 2.8                         |
| Compressive Strength (psi) (C-109)                             |          | Calcium Oxide (CaO)                              | 63.6                        |
| Mortar Cubes                                                   |          | Magnesium Oxide (MgO)                            | 2.4                         |
| 1 day                                                          | 2060     |                                                  |                             |
| 3 day                                                          | 3600     | Sulphur Trioxide (SO <sub>3</sub> )              | 2.8                         |
| 7 day                                                          | 4400     |                                                  |                             |
| 28 day                                                         | 5710     | Ignition Loss (%)                                | 2.6                         |
| Vicat Setting Time (C-191)                                     |          | Insoluble Residue (%)                            | 0.42                        |
| Initial (min.)                                                 | 120      |                                                  |                             |
| Final (min.)                                                   | 235      | Free Lime (%)                                    | 0.9                         |
| Air Content (%) (C-185)                                        | 6.5      | Tricalcium Silicate (C <sub>3</sub> S)           | 57                          |
| Autoclave Expansion (%) (C-151)                                | 0.020    | Tricalcium Aluminate (C3A)                       | 8                           |
| Heat of Hydration (kJ/kg) 7 days<br>(Date tested: Apr 6, 2012) | 366      | Equivalent Alkalis (%)                           | 0.59                        |
| LIMESTONE PERCENTAGE                                           |          | C <sub>3</sub> S + 4.75C <sub>3</sub> A          | 95                          |
| CO <sub>2 (%)</sub> (C-114)                                    | 1.7      |                                                  |                             |
| CaCO <sub>3 in Limestone (%)</sub>                             | 93       |                                                  |                             |
| Limestone $(\%)$ (C. 150)                                      | 4 1      |                                                  |                             |

CERTIFIED BY: Grant R Hender

Quality Manager - Alpena

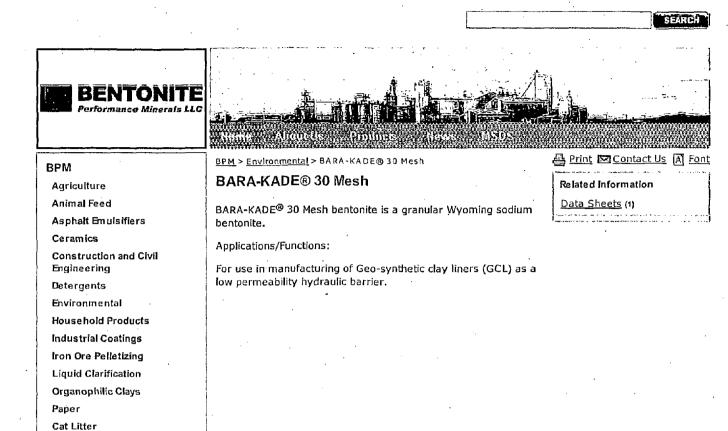
We hereby certify that this cement complies with current ASTM C 150 and AASHTO M 85 specifications.

4.1

Limestone (%) (C-150).....

#### BARA-KADE® 30 Mesh - Halliburton

:/14/12



<u>Products List</u> Material Safety Data Sheet

Absorbent Pet Products Wine and Julce Clarification

Search

Bentonite

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# **BARA-KADE<sup>®</sup>**

30 Bentonite

Description

BARA-KADE<sup>®</sup> 30 is an untreated high purity Wyoming sodium bentonite. It is used in the manufacturing of geosynthetic clay liners as a low permeability hydraulic barrier.

| Applications/Functions | <ul> <li>For use in manufacturing of Geo-synth<br/>permeability hydraulic barrier</li> <li>Soil sealing.</li> <li>Other hydraulic barrier applications.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | etic clay liners ((                               | GCL) as a low                                               |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------|
| Advantages             | <ul> <li>Untreated high purity sodium based be</li> <li>Exhibits high swelling potential and low sealing and reduce seepage.</li> <li>Yields dense, firm mass and texture.</li> <li>Compatible with cement and other content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content and the content a</li></ul> | v permeability to                                 |                                                             |
| Screen Analysis        | <ul> <li>Dry screen, percent plus 20 mesh</li> <li>Dry screen, percent minus 200 mesh</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <u>Typical</u>                                    | Specification<br>• 15 Max<br>• 10 Max                       |
| Properties             | <ul> <li>Moisture, percent</li> <li>Plate Water Absorption</li> <li>Swell Index</li> <li>Fluid Loss</li> <li>Specific Gravity</li> <li>Bulk Density (lbs/ft<sup>3</sup> compacted)</li> <li>Bulk Density (lbs/ft<sup>3</sup> uncompacted)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <u>Typical</u><br>•<br>•<br>• 2.7<br>• 76<br>• 67 | Specification<br>12 Max<br>750 Min<br>25 Min<br>18 Max<br>• |

Availability BARA-KADE® 30 can be purchased through any Bentonite Performance Minerals LLC assigned Reseller. To locate the BPM Reseller nearest you, contact the Customer Service Department in Houston or your area BPM Regional Sales Manager.

> Bentonite Performance Minerals LLC A Halliburton Company 3000 N. Sam Houston Pkwy E. Houston, TX 77032 www.bentonite.com

Customer Service (281) 871-7900

Fax (281) 871-7940

Rev. 02/2011

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Because the conditions of use of this product are beyond the seller's control, the product is sold without warranty either express or implied and upon condition that purchaser make its own test to determine the suitability for purchaser's application. Purchaser assumes all risk of use and handling of this product. This product will be replaced if defective in manufacture or packaging or if damaged. Except for such replacement, seller is not liable for any damages caused by this product or its use. The statements and recommendations made herein are believed to be accurate. No guarantee of their accuracy is made, however.

# **APPENDIX B3**

# CHEMICAL SOIL TESTING ANALYTICAL REPORTS

ace Analytical www.pacelabs.com

July 09, 2012

Glenn Luke Natural Resource Technologies 23713 W Park Rd Pewaukee, WI 53072

RE: Project: 2088 NORTH PLANT MGP Pace Project No.: 4062310

Dear Glenn Luke:

Enclosed are the analytical results for sample(s) received by the laboratory on June 22, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian Basten

brian.basten@pacelabs.com Project Manager

Enclosures



#### **REPORT OF LABORATORY ANALYSIS**

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#### CERTIFICATIONS

| Project:          | 2088 NORTH PLANT MGP |
|-------------------|----------------------|
| Pace Project No.: | 4062310              |
|                   |                      |

Green Bay Certification IDs 1241 Bellevue Street, Green Bay, WI 54302 Florida/NELAP Certification #: E87948 Illinois Certification #: 200050 Kentucky Certification #: 82 Louisiana Certification #: 04168 Minnesota Certification #: 055-999-334

New York Certification #: 11888 North Carolina Certification #: 503 North Dakota Certification #: R-150 South Carolina Certification #: 83006001 US Dept of Agriculture #: S-76505 Wisconsin Certification #: 405132750

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#### SAMPLE SUMMARY

#### Project: 2088 NORTH PLANT MGP Page Project No.: 4062310

| Lab ID     | Sample ID          | Matrix | Date Collected | Date Received  | - |
|------------|--------------------|--------|----------------|----------------|---|
| 4062310001 | 13794/AREA A,B,C,D | Solid  | 06/20/12 19:00 | 06/22/12 09:40 |   |
| •          |                    |        |                | •              |   |
|            |                    |        |                | •              |   |
|            |                    |        |                |                |   |
|            |                    |        |                |                |   |
|            |                    |        |                |                |   |
|            |                    |        |                |                |   |
|            |                    |        | •              |                |   |
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|            |                    |        |                |                |   |
|            |                    |        |                |                |   |
|            |                    |        |                |                |   |
| New Star   |                    |        |                |                |   |
|            |                    |        |                |                |   |
|            |                    | •      |                |                |   |
|            |                    |        |                |                |   |
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|            |                    |        |                |                |   |

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Analytes Reported

ARO

SMT

SMA

6 19

12

10

1

#### SAMPLE ANALYTE COUNT

EPA 8270

EPA 8260

ASTM D2974-87

|   | Project:<br>Pace Project No. | 2088 NORTH PLANT MGP<br>: 4062310 |                             |            |
|---|------------------------------|-----------------------------------|-----------------------------|------------|
| v | Lab ID                       | Sample ID                         | Method                      | Analysts   |
|   | 4062310001                   | 13794/AREA A,B,C,D                | EPA 6020<br>EPA 8270 by SIM | DS1<br>ARO |

**REPORT OF LABORATORY ANALYSIS** 

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### ANALYTICAL RESULTS

#### Project: 2088 NORTH PLANT MGP

Pace Project No.: 4062310

| Sample: 13794/AREA A,B,C,D             | Lab ID: 4062310001 | Collected: 06/20/12 19:00 | Received: | 06/22/12 09:40 | Matrix: Solid |  |
|----------------------------------------|--------------------|---------------------------|-----------|----------------|---------------|--|
| Results reported on a "dry-weight" bas | sis                |                           |           | ÷              |               |  |

| Parameters                                       | Results         | Units        | PQL           | MDL.        | DF         | Prepared                | Analyzed       | CAS No.           | Qual |
|--------------------------------------------------|-----------------|--------------|---------------|-------------|------------|-------------------------|----------------|-------------------|------|
| 6020 MET ICPMS                                   | Analytical M    | /lethod: EP/ | 16020 Prepar  | ation Metho | d: EP/     | A 3050                  |                |                   | •    |
| Arsenic                                          | <b>7.8</b> mg   | ı∕kg         | 1.2           | 0.16        | 10         | 07/06/12 09:10          | 07/07/12 09:55 | 7440-38-2         |      |
| Chromium                                         | 6.3 mg          | j/kg         | 1.2           | 0.20        | 10         | 07/06/12 09:10          | 07/07/12 09:55 | 7440-47-3         |      |
| Copper                                           | 16.3 mg         | ı/kg         | 1.2           | 0.58        | 10         | 07/06/12 09:10          | 07/07/12 09:55 | 7440-50-8         |      |
| Lead                                             | 29.1 mg         | 1/kg         | 1.2           | 0.10        | 10         | 07/06/12 09:10          | 07/07/12 09:55 | 7439-92-1         |      |
| Nickei                                           | 9.0 m           |              | 1.2           | 0.56        | 10         | 07/06/12 09:10          | 07/07/12 09:55 | 7440-02-0         |      |
| Zinc                                             | 65.9 mg         |              | 24.7          | 10.6        | 10         | 07/06 <b>/1</b> 2 09:10 | 07/07/12 09:55 | 7440-66-6         |      |
| 8270 MSSV PAH by SIM                             | Analytical N    | Aethod: EPA  | A 8270 by SIM | Preparatio  | n Meth     | od: EPA 3546            |                |                   |      |
| Acenaphthene                                     | <b>92000</b> ug | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 83-32-9           |      |
| Acenaphthylene                                   | 35800 ug        | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 208-96-8          |      |
| Anthracene                                       | 64600 ug        | /kg          | 16600         | 1700        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 120-12-7          |      |
| Benzo(a)anthracene                               | 40800 ug        | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 56-55-3           |      |
| Benzo(a)pyrene                                   | 31700 ug        | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 50-32-8           |      |
| Benzo(b)fluoranthene                             | 15700J ug       | /kg          | 16600         | 2390        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 205-99-2          |      |
| Benzo(g,h,i)perylene                             | 11100J ug       | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 191-24-2          |      |
| Benzo(k)fluoranthene                             | 24200 ug        | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 207-08-9          |      |
| Chrysene                                         | 40700 ug        | /kg          | 16600         | 1880        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 218-01-9          |      |
| Dibenz(a,h)anthracene                            | <8290 ug        | /kg          | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 53-70-3           |      |
| Fluoranthene                                     | 78200 ug        |              | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 206-44-0          |      |
| Fluorene                                         | 71800 ug        | -            | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 86-73-7           |      |
| Indeno(1,2,3-cd)pyrene                           | 9440J ug        | -            | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 193-39-5          |      |
| 2-Methylnaphthalene                              | 134000 ug       | ÷ .          | 16600         | 1550        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 91-57-6           |      |
| Naphthalene                                      | 464000 ug       | •            | 16600         | 3120        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 91-20-3           |      |
| Phenanthrene                                     | 203000 ug       | -            | 16600         | 2110        | 400        | 06/26/12 07:14          | 06/26/12 17:28 |                   |      |
| Pyrene                                           | 99200 ug        |              | 16600         | 8290        | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 129-00-0          |      |
| Surrogates                                       |                 |              |               |             |            |                         |                |                   |      |
| 2-Fluorobiphenyl (S)                             | 0 %.            |              | 43-130        |             | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 321-60-8          | S4   |
| Terphenyl-d14 (S)                                | 0 %             |              | 32-130        |             | 400        | 06/26/12 07:14          | 06/26/12 17:28 | 1718-5 <b>1-0</b> | S4   |
| 8270 MSSV FULL LIST<br>MICROWAVE                 | Analytical I    | Method: EP   | A 8270 Prepar | ation Meth  | od: EP/    | A 3546                  |                |                   |      |
| Carbazole                                        | 8860J ug        | Ma           | 31100         | 3210        | 25         | 06/27/12 08:20          | 06/29/12 18:34 | 86.74-8           |      |
| Dibenzofuran                                     | 26000J ug       |              | 31100         | 15500       | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   |      |
|                                                  | <15500 ug       | -            | 31100         | 15500       | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   |      |
| 2,4-Dimethylphenol<br>bis(2-Ethylhexyl)phthalate | <6360 ug        |              | 31100         | 6360        | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   |      |
|                                                  | <3240 ug        | -            | 31100         | 3240        | 25         | 06/27/12 08:20          | 06/29/12 18:34 | 117-01-1          |      |
| 3&4-Methylphenol(m&p Cresol)<br>Phenol           | <3690 Ug        | · +-         | 31100         | 3690        | 25         | 06/27/12 08:20          | 06/29/12 18:34 | 109 05 2          | D3   |
| Surrogates                                       | <3090 Ug        | рку          | 31100         | 2080        | 20         | 00/2/112 00.20          | 00129112 10.34 | 100-90-2          | 03   |
| Nitrobenzene-d5 (S)                              | 68 %            |              | 44-130        |             | 25         | 06/27/12 08:20          | 06/29/12 18:34 | 4165-60-0         |      |
| 2-Fluorobiphenyl (S)                             | 76 %            |              | 43-130        |             | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   |      |
| Terphenyl-d14 (S)                                | 78 %            |              | 10-130        |             | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   | D3   |
| Phenol-d6 (S)                                    | 68 %            |              | 26-130        |             | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   | 20   |
| 2-Fluorophenol (S)                               | 60 %            |              | 20-130        |             | 25         | 06/27/12 08:20          | 06/29/12 18:34 |                   |      |
| 2,4,6-Tribromophenol (S)                         | 55 %            |              | 11-130        |             | 25         | 06/27/12 08:20          |                |                   |      |
| 2,4,0-minomophenion (a)                          | 00 %            | •            | 11-100        |             | <u>c</u> J | 30/21112 00.20          | 50120112 10.04 | 10-10-0           |      |

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#### ANALYTICAL RESULTS

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4062310

Sample: 13794/AREA A,B,C,D Lab ID: 4062310001 Collected: 06/20/12 19:00 Received: 06/22/12 09:40 Matrix: Solid Results reported on a "dry-weight" basis

| Parameters                                    | Results    | Units                                                          | PQL        | MDL  | DF  | Prepared       | Analyzed       | CAS No.   | Qual  |
|-----------------------------------------------|------------|----------------------------------------------------------------|------------|------|-----|----------------|----------------|-----------|-------|
| 8260 MSV Med Level Full List                  | Analytical | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B |            |      |     |                |                |           |       |
| Benzene                                       | 8830 u     | ig/kg                                                          | 4970       | 2790 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 71-43-2   |       |
| 1,1-Dichloroethane                            | <1630 u    | g/kg                                                           | 12400      | 1630 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 75-34-3   |       |
| cis-1,2-Dichloroethene                        | <2060 u    | g/kg                                                           | 12400      | 2060 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 156-59-2  |       |
| Ethylbenzene                                  | 18600 u    | ig/kg                                                          | 6220       | 2540 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 100-41-4  |       |
| Toluene                                       | 20600 u    | ig/kg                                                          | 12400      | 1910 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | ×108-88-3 |       |
| Vinyl chloride                                | <2490 u    | ig/kg                                                          | 12400      | 2490 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 75-01-4   |       |
| Xylene (Total)                                | 43500 u    | ıg/kg                                                          | 18600      | 6130 | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 1330-20-7 |       |
| <i>Surrogates</i><br>Dibromofluoromethane (S) | 0%         | 6.                                                             | 57-149     |      | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 1868-53-7 | D3,S4 |
| Toluene-d8 (S)                                | 0%         | 6.                                                             | 55-152     |      | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 2037-26-5 | S4    |
| 4-Bromofluorobenzene (S)                      | 0 %        | 6                                                              | 40-139     |      | 200 | 06/25/12 12:57 | 06/26/12 20:12 | 460-00-4  | S4    |
| Percent Moisture                              | Analytical | Method: AST                                                    | M D2974-87 |      |     |                |                |           |       |
| Percent Moisture                              | 19.6 %     | 6                                                              | 0.10       | 0.10 | 1   |                | 07/05/12 14:59 |           |       |

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#### QUALITY CONTROL DATA

| Project: | 2088 NORTH PLANT MGP |  |
|----------|----------------------|--|
|          |                      |  |

Pace Project No.: 4062310

| QC Batch:          | MPRP/7150        | Analysis Method:      | EPA 6020 | · · · · · · · · · · · · · · · · · · · |
|--------------------|------------------|-----------------------|----------|---------------------------------------|
| QC Batch Method:   | EPA 3050         | Analysis Description: | 6020 MET |                                       |
| Associated Lab Sam | ples: 4062310001 |                       |          |                                       |

| METHOD BLANK: 631540        |         | Matrix:         | Solid              |                |                         |
|-----------------------------|---------|-----------------|--------------------|----------------|-------------------------|
| Associated Lab Samples: 406 | 2310001 | , .             |                    |                |                         |
| Parameter                   | Units   | Blank<br>Result | Reporting<br>Limit | Analyzed       | Qualifiers              |
| Arsenic                     | mg/kg   | <0.013          | 0,10               | 07/07/12 09:42 | <u>-</u> , <u>-</u> , - |
| Chromium                    | mg/kg   | 0.045J          | 0.10               | 07/07/12 09:42 |                         |
| Copper                      | mg/kg   | <0.047          | 0.10               | 07/07/12 09:42 |                         |
| Lead                        | mg/kg   | 0.022J          | 0.10               | 07/07/12 09:42 |                         |
| Nickel                      | mg/kg   | <0.046          | 0.10               | 07/07/12 09:42 |                         |
| Zinc                        | mg/kg   | <0.86           | 2.0                | 07/07/12 09:42 |                         |

#### LABORATORY CONTROL SAMPLE: 631541

| Parameter | Units | Spike<br>Conc. | LCS<br>Result | LCS<br>% Rec | % Rec<br>Limits | Qualifiers |
|-----------|-------|----------------|---------------|--------------|-----------------|------------|
| enic      | mg/kg | 50             | 52.9          | 106          | 80-120          |            |
| mium      | mg/kg | 50             | 48.8          | . 98         | 80-120          |            |
| er.       | mg/kg | 50             | 49.1          | 98           | 80-120          |            |
|           | mg/kg | 50             | 49.8          | 100          | 80-120          |            |
|           | mg/kg | 50             | 51.6          | 103          | 80-120          | `          |
|           | mg/kg | 50             | 53.5          | 107          | 80-120          |            |

#### MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 631542

|           | 4(    | 062310001 | MS<br>Spike | MSD<br>Spike | MS     | MSD           | ,<br>MS | MSD   | % Rec  |     | Max |      |
|-----------|-------|-----------|-------------|--------------|--------|---------------|---------|-------|--------|-----|-----|------|
| Parameter | Units | Result    | Conc.       | Conc.        | Result | Result        | % Rec   | % Rec | Limits | RPD | RPD | Qual |
| Arsenic   | mg/kg | 7.8       | 62          | 61.7         | 67.1   | 67.2          | 96      | 96    | 75-125 | 0   | 20  |      |
| Chromium  | mg/kg | 6.3       | 62          | 61.7         | 68.8   | 6 <b>9</b> .1 | 101     | 102   | 75-125 | 0   | 20  | · ·  |
| Copper    | mg/kg | 16.3      | 62          | 61.7         | 77.9   | 78.4          | 99      | 101   | 75-125 | 1   | 20  |      |
| Lead      | mg/kg | 29.1      | 62          | 61.7         | 90.5   | 90.0          | 99      | 99    | 75-125 | 1   | 20  |      |
| Nickel    | mg/kg | 9.0       | 62          | 61.7         | 69.1   | 68.7          | 97      | 97    | 75-125 | 1   | 20  |      |
| Zinc      | mg/kg | 65.9      | 62          | 61.7         | 142    | 135           | 122     | 112   | 75-125 | 5   | 20  |      |

631543

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#### QUALITY CONTROL DATA

| Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                                                      | 01<br>01<br>Units |               | -                        | PA 8260<br>260 MSV Med Lev<br>Analyzed | rel Full List      |              |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------|--------------------------|----------------------------------------|--------------------|--------------|------------|
| Associated Lab Samples: 406231000<br>METHOD BLANK: 626358<br>Associated Lab Samples: 406231000<br>Parameter<br>1,1-Dichloroethane<br>Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride | 01<br>01<br>Units | Matr<br>Blank | x: Solid<br>Reporting    |                                        |                    |              |            |
| METHOD BLANK: 626358<br>Associated Lab Samples: 406231000<br>Parameter<br>1,1-Dichloroethane<br>Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                      | 01<br>Units       | Blank         | Reporting                |                                        | Qualifier          |              |            |
| Associated Lab Samples: 406231000<br>Parameter<br>1,1-Dichloroethane<br>Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                              | Units             | Blank         | Reporting                |                                        | Qualifier          |              |            |
| Parameter<br>1,1-Dichloroethane<br>Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                   | Units             |               |                          | Analyzed                               | Qualifier          |              |            |
| 1,1-Dichloroethane<br>Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                                |                   |               |                          | Analyzed                               | Qualifier          |              |            |
| 1,1-Dichloroethane<br>Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                                |                   | Result        |                          | Analyzed                               | Ouslifiem          |              |            |
| Benzene<br>cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                                                      |                   |               |                          |                                        | Guainers           |              |            |
| cis-1,2-Dichloroethene<br>Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                                                                 | ug/kg             | <6.           | 5 50.0                   | 06/26/12 11:49                         |                    | -            |            |
| Ethylbenzene<br>Toluene<br>Vinyl chloride                                                                                                                                                                           | ug/kg             | <11.          | 2 20.0                   | 06/26/12 11:49                         |                    |              |            |
| Toluene<br>Vinyl chloride                                                                                                                                                                                           | ug/kg             | <8.           | 3 50.0                   | 06/26/12 11:49                         |                    |              |            |
| Vinyl chloride                                                                                                                                                                                                      | ug/kg             | · <10.        | 2 25.0                   | 06/26/12 11:49                         |                    |              |            |
| •                                                                                                                                                                                                                   | ug/kg             | <7.           | 7 50.0                   | 06/26/12 11:49                         |                    |              |            |
| Xvlene (Total)                                                                                                                                                                                                      | ug/kg             | <10           | 0 50.0                   | 06/26/12 11:49                         |                    |              |            |
|                                                                                                                                                                                                                     | ug/kg             | <24.          | 7 75.0                   | 06/26/12 11:49                         |                    |              |            |
| 4-Bromofluorobenzene (S)                                                                                                                                                                                            | %.                | g             | 6 40-139                 | 06/26/12 11:49                         |                    |              |            |
| Dibromofluoromethane (S)                                                                                                                                                                                            | %.                | 9             | 7 57-149                 | 06/26/12 11:49                         |                    |              |            |
| Toluene-d8 (S)                                                                                                                                                                                                      | %.                | 10            | 7 55-152                 | 2 06/26/12 11:49                       |                    |              |            |
| LABORATORY CONTROL SAMPLE & I                                                                                                                                                                                       |                   |               | 626360                   | · · · · · · · · · · · · · · · · · · ·  |                    | <u></u>      |            |
| LABOINTONT CONTROL SAMPLE &                                                                                                                                                                                         | 2000, 020009      | 0             |                          |                                        | 01 D.S             | • •          |            |
| Parameter                                                                                                                                                                                                           | Units             | •             | .CS LCSD<br>esult Result | LCS LCSD<br>% Rec % Rec                | % Rec<br>Limits RP | Max<br>D RPD | Qualifiers |

| Parameter                | Units | Conc. | Result | Result | % Rec | % Rec | Limits | RPD | RPD | Qualifiers  |
|--------------------------|-------|-------|--------|--------|-------|-------|--------|-----|-----|-------------|
| 1,1-Dichloroethane       | ug/kg | 2500  | 2480   | 2480   | 99    |       | 70-131 | 0   | 20  | · · · · · · |
| Benzene                  | ug/kg | 2500  | 2400   | 2440   | 96    | 97    | 70-130 | 1   | 20  |             |
| cis-1,2-Dichloroethene   | ug/kg | 2500  | 2590   | 2500   | 104   | 100   | 70-130 | . 4 | 20  |             |
| Ethylbenzene             | ug/kg | 2500  | 2620   | 2540   | 105   | 102   | 70-130 | 3   | 20  |             |
| Toluene                  | ug/kg | 2500  | 2640   | 2560   | 106   | 103   | 70-130 | 3   | 20  |             |
| Vinyl chloride           | ug/kg | 2500  | 2140   | 2110   | 86    | 84    | 55-130 | 2   | 20  |             |
| Xylene (Total)           | ug/kg | 7500  | 7930   | 7810   | 106   | 104   | 70-130 | 1   | 20  |             |
| 4-Bromofluorobenzene (S) | %.    |       |        |        | 102   | 102   | 40-139 |     |     | •           |
| Dibromofluoromethane (S) | %.    |       |        |        | 101   | 103   | 57-149 |     |     |             |
| Toluene-d8 (S)           | %.    |       |        |        | 107   | 108   | 55-152 |     |     |             |

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#### QUALITY CONTROL DATA

Analysis Method:

Analysis Description:

Matrix: Solid

EPA 8270 by SIM

8270/3546 MSSV PAH by SIM

| Project:         | 2088 NORTH PLANT MGP |
|------------------|----------------------|
| Date Destant Max | 4000040              |

Pace Project No.: 4062310

| QC Batch:        | OEXT/14975 |
|------------------|------------|
| QC Batch Method: | EPA 3546   |

Associated Lab Samples: 4062310001

METHOD BLANK: 626563

Associated Lab Samples: 4062310001

| Associated Lab Samples. 400 | 52310001     |                 |                    | 1              |            |  |
|-----------------------------|--------------|-----------------|--------------------|----------------|------------|--|
| Parameter                   | Units        | Blank<br>Result | Reporting<br>Limit | Analyzed       | Qualifiers |  |
|                             | <del>_</del> |                 |                    |                |            |  |
| 2-Methylnaphthalene         | ug/kg        | <1.6            | 16.7               | 06/26/12 11:27 |            |  |
| Acenaphthene                | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Acenaphthylene              | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Anthracene                  | ug/kg        | <1.7            | 16.7               | 06/26/12 11:27 |            |  |
| Benzo(a)anthracene          | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Benzo(a)pyrene              | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Benzo(b)fluoranthene        | ug/kg        | <2.4            | 16.7               | 06/26/12 11:27 |            |  |
| Benzo(g,h,i)perylene        | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Benzo(k)fluoranthene        | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Chrysene                    | ug/kg        | <1.9            | 16.7               | 06/26/12 11:27 |            |  |
| Dibenz(a,h)anthracene       | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 | •          |  |
| Fluoranthene                | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Fluorene                    | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Indeno(1,2,3-cd)pyrene      | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| Naphthalene                 | ug/kg        | <3.1            | 16.7               | 06/26/12 11:27 |            |  |
| Phenanthrene                | ug/kg        | <2.1            | 16.7               | 06/26/12 11:27 |            |  |
| Pyrene                      | ug/kg        | <8.3            | 16.7               | 06/26/12 11:27 |            |  |
| 2-Fluorobiphenyl (S)        | %.           | 78              | 43-130             | 06/26/12 11:27 |            |  |
| Terphenyl-d14 (S)           | %.           | 82              | 32-130             | 06/26/12 11:27 |            |  |

#### LABORATORY CONTROL SAMPLE: 626564

| Parameter              | Units  | Spike<br>Conc. | LCS<br>Result | LCS<br>% Rec | % Rec<br>Limits | Qualifiers |
|------------------------|--------|----------------|---------------|--------------|-----------------|------------|
| 2-Methylnaphthalene    | ug/kg  | 333            | 261           | 78           | 45-130          |            |
| Acenaphthene           | ug/kg  | 333            | 242           | 73           | 51-130          |            |
| Acenaphthylene         | ug/kg  | 333            | 242           | 73           | 53-130          |            |
| Anthracene             | ug/kg  | 333            | 249           | 75           | 48-130          |            |
| Benzo(a)anthracene     | ug/kg  | 333            | 239           | 72           | 55-130          |            |
| Benzo(a)pyrene         | ug/kg  | 333            | 244           | 73           | 56-130          |            |
| Benzo(b)fluoranthene   | ug/kg  | 333            | 267           | 80           | 53-130          |            |
| Benzo(g,h,i)perylene   | `ug/kg | 333            | 212           | 64           | 58-130          |            |
| Benzo(k)fluoranthene   | ug/kg  | 333            | 231           | 69           | 55-130          |            |
| Chrysene               | ug/kg  | 333            | 247           | 74           | 5 <b>9-1</b> 30 |            |
| Dibenz(a,h)anthracene  | ug/kg  | 333            | 235           | 71           | 56-130          |            |
| Fluoranthene           | ug/kg  | 333            | 254           | 76           | 56-130          |            |
| Fluorene               | ug/kg  | 333            | 257           | 77           | 54-130          |            |
| indeno(1,2,3-cd)pyrene | ug/kg  | 333            | 222           | 67           | 57-130          |            |
| Naphthalene            | ug/kg  | 333            | 235           | 70           | 43-130          | ·          |
| Phenanthrene           | ug/kg  | 333            | 245           | 74           | 56-130          |            |
| Pyrene                 | ug/kg  | 333            | 262           | 79           | 54-130          |            |
| 2-Fluorobiphenyl (S)   | %.     |                |               | 68           | 43-130          |            |

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#### QUALITY CONTROL DATA

Project: 2088 NORTH PLANT MGP

Pace Project No.: 4062310

| LABORATORY CONTROL S    | AMPLE: 6265   | o4 /      | Spike   | LCS            |              | LCS    | % Rec  |       |           |     |      |      |
|-------------------------|---------------|-----------|---------|----------------|--------------|--------|--------|-------|-----------|-----|------|------|
| Parameter               |               | Units     | Conc.   | Resu           |              | % Rec  | Limits |       | ualifiers |     |      |      |
| Terphenyl-d14 (S)       | %.            |           |         |                |              | 72     | 32     | -130  |           | -   |      |      |
| MATRIX SPIKE & MATRIX S | PIKE DUPLICAT | E: 62656  | 5       | • <del>•</del> | 626566       |        |        |       |           |     |      |      |
|                         |               |           | MS      | MSD            |              |        |        |       |           |     |      |      |
|                         | 40            | 062259002 | Spike   | Spike          | MS           | MSD    | MS     | MSD   | % Rec     | ;   | Max  |      |
| Parameter               | Units         | Result    | Conc.   | Conc.          | Result       | Result | % Rec  | % Rec | Limits    | RPD | RPD  | Qual |
| 2-Methylnaphthalene     | ug/kg         | <1.6      | 347     | 347            | 274          | 271    | 79     | 78    | 39-130    | 1   | - 33 |      |
| Acenaphthene            | ug/kg         | <8.7      | 347     | 347            | 256          | 250    | . 74   | 72    | 40-130    | 2   | 20   |      |
| Acenaphthylene          | ug/kg         | ` <8.7    | 347     | 347            | 257          | 251    | 74     | 72    | 40-130    | 3   | 20   |      |
| Anthracene              | ug/kg         | 2.3J      | 347     | 347            | 266          | 262    | 76     | 75    | 46-130    | 2   | 24   |      |
| Benzo(a)anthracene      | ug/kg         | <8.7      | 347     | 347            | 248          | . 240  | 69     | 67    | 42-130    | 3   | 25   |      |
| Benzo(a)pyrene          | ug/kg         | 10.3J     | · ′ 347 | 347            | . 264        | 258    | 73     | 71    | 40-130    | 2   | 31   |      |
| Benzo(b)fluoranthene    | ug/kg         | . 12.6J   | 347     | 347            | 275          | 280    | 75     | 77    | 45-130    | 2   | 29   |      |
| Benzo(g,h,i)perylene    | ug/kg         | 11.5J     | 347     | 347            | 205          | 202    | 56     | 55    | 16-143    | 2   | 23   |      |
| Benzo(k)fluoranthene    | ug/kg         | 11.2J     | 347     | 347            | 262          | 254    | 72     | 70    | 38-130    | 3   | 33   |      |
| Chrysene                | ug/kg         | 13.0J     | 347     | 347            | 257          | 254    | 70     | 69    | 38-130    | 1   | 31   |      |
| Dibenz(a,h)anthracene   | ug/kg         | <8.7      | 347     | 347            | 224          | 219    | 64     | 62    | 30-135    | 3   | 23   |      |
| Fluoranthene            | ug/kg         | 19.5      | 347     | 347            | 274          | 268    | 73     | 72    | 42-133    | 2   | 28   |      |
| Fluorene                | ug/kg         | <8.7      | 347     | 347            | 268          | 264    | 77     | 76    | 43-130    | 1   | 22   |      |
| Indeno(1,2,3-cd)pyrene  | ug/kg         | <8.7      | 347     | 347            | <u>213 ک</u> | 207    | 59     | 58    | 15-150    | 3   | 27   |      |
| Naphthalene             | ug/kg         | <3.3      | 347     | 347            | 246          | 238    | 71     | 69    | 24-130    | 3   | 33,  |      |
| Phenanthrene            | ug/kg         | 11.7J     | 347     | 347            | 264          | 256    | 73     | 70    | -27-135   | 3   | 27   |      |
| Pyrene                  | ug/kg         | 17.1J     | 347     | 347            | 275          | 268    | 74     | 72    | 36-130    | 3   | 23   |      |
| 2-Fluorobiphenyl (S)    | %.            |           |         |                |              |        | 74     | 75    | 43-130    |     |      |      |
| Terphenyl-d14 (S)       | %.            |           |         |                | •            |        | · 73   | 75    | 32-130    |     |      |      |

 $\boldsymbol{\boldsymbol{\varsigma}}_{-} = \boldsymbol{\boldsymbol{\varepsilon}}_{-}$ 

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#### QUALITY CONTROL DATA

| Project:          | 2088 NORTH PLANT MGP |  |
|-------------------|----------------------|--|
| Pace Project No.: | 4062310              |  |

| QC Batch:           | OEXT/14989      |       | Analysis Met | hod: El      | PA 8270            |            |      |
|---------------------|-----------------|-------|--------------|--------------|--------------------|------------|------|
| QC Batch Method:    | EPA 3546        |       | Analysis Des | cription: 82 | 270 Solid MSSV Mie | crowave    |      |
| Associated Lab Samp | les: 4062310001 |       |              |              |                    |            |      |
| METHOD BLANK: 6     | 27262           |       | Matrix:      | Solid        |                    |            | <br> |
| Associated Lab Samp | les: 4062310001 |       |              |              |                    |            |      |
|                     |                 |       | Blank        | Reporting    |                    |            |      |
| Parame              | ter             | Units | Result       | Limit        | Analyzed           | Qualifiers |      |
| 2,4-Dimethylphenol  | ug/             | kg    | <83.3        | 167          | 06/27/12 11:08     |            |      |
|                     |                 |       |              |              |                    |            |      |

| 211 5.116413151161161        |       | .00.0 | 191             |                |   |
|------------------------------|-------|-------|-----------------|----------------|---|
| 3&4-Methylphenol(m&p Cresol) | ug/kg | <17.4 | 167             | 06/27/12 11:08 |   |
| bis(2-Ethylhexyl)phthalate   | ug/kg | <34.1 | 167             | 06/27/12 11:08 |   |
| Carbazole                    | ug/kg | <17.2 | 167             | 06/27/12 11:08 |   |
| Dibenzofuran                 | ug/kg | <83.3 | 167             | 06/27/12 11:08 |   |
| Phenol                       | ug/kg | <19.8 | 167             | 06/27/12 11:08 |   |
| 2,4,6-Tribromophenol (S)     | %.    | 87    | 11-130          | 06/27/12 11:08 |   |
| 2-Fluorobiphenyl (S)         | %.    | 79    | 43-130          | 06/27/12 11:08 |   |
| 2-Fluorophenol (S)           | %.    | 61    | <b>20-13</b> 0  | 06/27/12 11:08 |   |
| Nitrobenzene-d5 (S)          | %.    | 80    | 44-130          | 06/27/12 11:08 |   |
| Phenol-d6 (S)                | %.    | 72    | 26-130          | 06/27/12 11:08 | - |
| Terphenyl-d14 (S)            | %.    | 77    | 1 <b>0-1</b> 30 | 06/27/12 11:08 |   |
|                              |       |       |                 |                |   |

#### LABORATORY CONTROL SAMPLE: 627263

| Parameter                    | Units | Spike<br>Conc. | LCS<br>Result | LCS<br>% Rec | % Rec<br>Limits | Qualifiers |
|------------------------------|-------|----------------|---------------|--------------|-----------------|------------|
|                              |       |                | 1/6301        |              |                 |            |
| 2,4-Dimethylphenol           | ug/kg | 1670           | 1580          | 95           | 57-130          |            |
| 3&4-Methylphenol(m&p Cresol) | ug/kg | 1670           | 1290          | 78           | 56-130          |            |
| bis(2-Ethylhexyi)phthalate   | ug/kg | 1670           | 1280          | 77           | 65-134          |            |
| Carbazole                    | ug/kg | 1670           | 1490          | 89           | 70-130          |            |
| Dibenzofuran                 | ug/kg | 1670           | 1430          | · 86         | 70-130          |            |
| Phenol                       | ug/kg | 1670           | 1350          | 81           | 57-130          |            |
| 2,4,6-Tribromophenol (S)     | %.    |                |               | 83           | 11-130          |            |
| 2-Fluorobiphenyl (S)         | %.    |                |               | 79           | 43-130          |            |
| 2-Fluorophenol (S)           | %.    |                |               | 71           | 20-130          |            |
| Nitrobenzene-d5 (S)          | %.    |                |               | 81           | 44-130          |            |
| Phenol-d6 (S)                | %.    |                |               | 76           | 26-130          |            |
| Terphenyl-d14 (S)            | %.    |                |               | 78           | 10-130          |            |

| MATRIX SPIKE & MATRIX SP        | PIKE DUPLICAT | E: 62726  | 4            |              | 627265 |              |       |       |        |     |     |      |
|---------------------------------|---------------|-----------|--------------|--------------|--------|--------------|-------|-------|--------|-----|-----|------|
|                                 |               | 062283003 | MS<br>Spike  | MSD<br>Spike | MS     | MSD          | MS    | MSD   | % Rec  |     | Max |      |
| Parameter                       | Units         | Result    | Conc.        | Conc.        | Result | Result       | % Rec | % Rec | Limits | RPD | RPD | Qual |
| 2,4-Dimethylphenol              | ug/kg         | <95.8     | 1920         | 1920         | 1800   | 1590         | 94    | 83    | 19-134 | 12  | 38  | ·    |
| 3&4-Methylphenol(m&p<br>Cresal) | ug/kg         | <20.0     | 19 <b>20</b> | 1920         | 1620   | 1490         | 85    | 78    | 28-130 | 8   | 36  |      |
| bis(2-Ethylhexyl)phthalate      | ug/kg         | <39.2     | 1920         | 1920         | 1350   | 1210         | 70    | 63    | 25-160 | 11  | 33  |      |
| Carbazole                       | ug/kg         | <19.8     | 1920         | 1920         | 1680   | <b>1</b> 560 | 87    | 82    | 26-134 | 7   | 31  |      |
| Dibenzofuran                    | ug/kg         | <95.8     | 1920         | 1920         | 1560   | 1450         | 82    | 76    | 40-130 | 7   | 27  |      |
| Phenol .                        | ug/kg         | <22.8     | 1920         | 1920         | 1650   | 1570         | 86    | 82    | 34-130 | 5   | 29  |      |

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#### QUALITY CONTROL DATA

Project:2088 NORTH PLANT MGPPace Project No.:4062310

| MATRIX SPIKE & MATRIX SP | PIKE DUPLICAT | E: 62726            |                      | _                     | 627265       |               |             |              |                 |     |            |      |
|--------------------------|---------------|---------------------|----------------------|-----------------------|--------------|---------------|-------------|--------------|-----------------|-----|------------|------|
| Parameter                | 41<br>Units   | 062283003<br>Result | MS<br>Spike<br>Conc. | MSD<br>Spike<br>Conc. | MS<br>Result | MSD<br>Result | MS<br>% Rec | MSD<br>% Rec | % Rec<br>Limits | RPD | Max<br>RPD | Qual |
| 2,4,6-Tribromophenol (S) | %.            |                     |                      |                       |              |               | 90          | 84           | 11-130          |     |            |      |
| 2-Fluorobiphenyl (S)     | %.            |                     |                      |                       |              |               | 80          | 79           | 43-130          |     |            |      |
| 2-Fluorophenol (S)       | %.            |                     |                      |                       |              |               | 70          | 67           | 20-130          |     |            |      |
| Nitrobenzene-d5 (S)      | %.            |                     |                      |                       |              |               | 83          | 78           | 44-130          |     |            |      |
| Phenol-d6 (S)            | %.            | •                   |                      |                       |              |               | 77          | 74           | 26-130          |     |            |      |
| Terphenyl-d14 (S)        | %.            |                     |                      |                       |              |               | 91          | 79           | 10-130          |     |            |      |

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#### QUALITY CONTROL DATA

Project:2088 NORTH PLANT MGPPace Project No.:4062310

 QC Batch:
 PMST/7246
 Analysis Method:
 ASTM D2974-87

 QC Batch Method:
 ASTM D2974-87
 Analysis Description:
 Dry Weight/Percent Moisture

 Associated Lab Samples:
 4062310001
 Analysis Description:
 Dry Weight/Percent Moisture

SAMPLE DUPLICATE: 631461

| Parameter        | Units | 4062357001<br>Result | Dup<br>Result | RPD | Max<br>RPD | Qualifiers |
|------------------|-------|----------------------|---------------|-----|------------|------------|
| Percent Moisture | %     | 12.3                 | 12.6          | . 2 | 1          | 0          |

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#### QUALIFIERS

|                    |                      | <del></del> | <br>· · · · · | <br> | <br> |
|--------------------|----------------------|-------------|---------------|------|------|
| Pace Project No .: | 4062310              |             |               |      |      |
| Project:           | 2088 NORTH PLANT MGP |             |               |      |      |

#### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

**RPD** - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **BATCH QUALIFIERS**

Baich: MSV/15650

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

#### ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference. S4

Surrogate recovery not evaluated against control limits due to sample dilution.

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#### QUALITY CONTROL DATA CROSS REFERENCE TABLE

| • | Lah 10            | Octobelle ID         |  |   | Analytical |
|---|-------------------|----------------------|--|---|------------|
|   | Pace Project No.: | 4062310              |  |   |            |
|   | Project:          | 2088 NORTH PLANT MGP |  | • |            |

| Labid      | Sample ID          | QC Batch Method | QC Batch   | Analytical Method | Batch     |
|------------|--------------------|-----------------|------------|-------------------|-----------|
| 4062310001 | 13794/AREA A,B,C,D | EPA 3050        | MPRP/7150  | EPA 6020          | (CPM/3195 |
| 4062310001 | 13794/AREA A,B,C,D | EPA 3546        | OEXT/14975 | EPA 8270 by SIM   | MSSV/4746 |
| 4062310001 | 13794/AREA A,B,C,D | EPA 3546        | OEXT/14989 | EPA 8270          | MSSV/4749 |
| 4062310001 | 13794/AREA A,B,C,D | EPA 5035/5030B  | MSV/15646  | EPA 8260          | MSV/15650 |
| 4062310001 | 13794/AREA A,B,C,D | ASTM D2974-87   | PMST/7246  |                   |           |
| ,          |                    |                 |            |                   |           |

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# APPENDIX B4

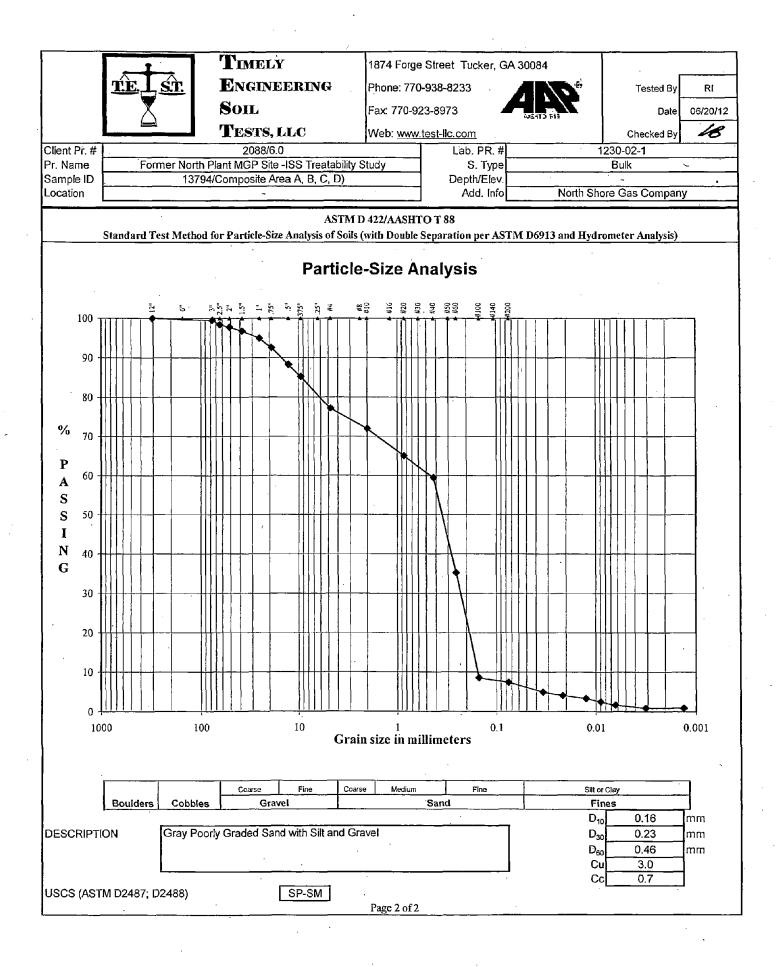
# PHYSICAL SOIL TESTING REPORTS

|                 |                | <u>t</u>       |           | TIME                                  | X            | 1874 Forge       | Street  | Tucke     | er, GA     | 30084        |        |             |          |                                              |
|-----------------|----------------|----------------|-----------|---------------------------------------|--------------|------------------|---------|-----------|------------|--------------|--------|-------------|----------|----------------------------------------------|
|                 | <u>er</u>      | ELŚ            | <u>r.</u> | ENGIN                                 | TEERING      | Phone: 77        | 0-938-8 | 3233      | Fax:       | 770-923      | 8-8973 |             |          |                                              |
| 1               |                | - <del>-</del> |           | Soil                                  |              | Cell: 678-6      |         |           |            |              |        |             |          |                                              |
| 1               |                | $\Delta$       |           | TESTS                                 |              | ł                |         |           |            |              |        |             |          |                                              |
|                 |                |                |           |                                       |              | Web: <u>www.</u> |         | .com      |            |              |        |             |          |                                              |
|                 |                |                |           | Sum                                   | mary of S    | Soil Test        | ing     |           |            |              |        |             |          |                                              |
|                 |                |                |           |                                       |              |                  |         |           |            |              | _      |             |          |                                              |
| Project Number: | 1230-02        | -1             |           |                                       |              |                  |         |           |            | ct Num       |        | 2088/6.0    |          | <b></b>                                      |
|                 | ,              |                |           |                                       |              |                  |         | Projec    | et Nam     | ie:          | Former | North Pla   | ant MGP  | Site                                         |
|                 | ·····          | r              | <b>,</b>  | ,                                     | Grain Size   |                  | Atter   | berg L    | imite      | Unit         | Weight | Hydra       | ulic Con | ductivity                                    |
| T.E.S.T.        | Client         |                | Moisture  |                                       | Distribution | 1                |         | 201.9 -   |            | Wet          | Dry    | Initial     |          | Hydraulic                                    |
| Sample          | Sample         | Hecé           | Content   | }                                     | % Finer      | % Finer          | L.L.    | P.L.      | P.I.       |              |        | M.C.        | -        | Conduct.                                     |
| Number          | Number         | 0303           | (%)       |                                       | #200 Sieve   |                  | %       | г.с.<br>% | г.і.<br>%  | pcf          | pcf    | 1¥1.C.<br>% | pcf      | cm/sec                                       |
| 13794           | Comp.(A,B,C,D) | SP-SM          | 30.6      | 77                                    | 7            | 1                | NP      | NP        | NP         | 1111.3       | 85.2   |             |          | Cimaco                                       |
|                 | -              | -              |           |                                       | <u> </u>     | ·                |         |           |            |              |        |             | <u> </u> | ┟╾╌╌╾┥                                       |
|                 |                |                |           |                                       |              |                  |         |           | - <u> </u> |              |        | -           |          |                                              |
| -               | -              |                | -         |                                       |              | -                | -       | ~         | -          | -            | -      | -           | -        | - 1                                          |
| -               | -              |                |           | -                                     |              | -                | -       | 4         | -          | <b>_</b> _ ` | -      | -           | -        |                                              |
|                 | -              | -              | -         | -                                     | -            |                  |         | -         | -          |              |        |             | -        | -                                            |
|                 |                | <u>_</u>       |           |                                       |              |                  |         |           |            |              |        |             |          |                                              |
| <u>-</u>        |                | <u> </u>       |           | · · · · · · · · · · · · · · · · · · · |              | ·····            |         | -         |            |              |        |             | ļ        | <u>                                     </u> |
| ļ               | ·              | - ·            |           | -                                     | -            |                  |         |           |            |              |        |             |          |                                              |
|                 |                |                |           |                                       |              |                  |         |           |            |              |        |             | <u>}</u> |                                              |
| <br>            |                | <u>-</u>       |           |                                       | <u> </u>     |                  |         |           |            |              |        |             |          | ┼╾╍╌╴┥                                       |
|                 |                |                |           |                                       | _            |                  |         |           |            |              |        |             |          | -                                            |
| -               |                |                |           |                                       |              | -                | -       | - /       | -          | -            | -      | -           |          | - 1                                          |
| -               | <u> </u>       |                | -         | -                                     | -            | -                | -       | -         | -          | -            | -      | -           | -        | -                                            |
| -               |                | -              |           | -                                     | -            | -                | •       | -         |            |              | -      |             |          |                                              |
|                 | -              |                |           |                                       |              |                  |         |           |            |              |        |             |          |                                              |
| -               |                | <u> </u>       |           |                                       | <u>ل</u> ا   | -                | -       | -         |            | L -          |        | -           | -        | <u> </u>                                     |
|                 |                |                |           |                                       | •            |                  |         |           |            |              |        |             |          |                                              |

| Standard Test Me                                                                                                                                | SOIL<br>TESTS<br>2086<br>North Plant MGP 3<br>13794/Composite<br>213794/Composite<br>213794/Composite<br>13794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/C | NEERIN<br>, LLC<br>3/6.0<br>Site -ISS Tr<br>Area A, B,<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | eatability Stu<br>C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of Ta<br>Dry Mass, of Ta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Phone: 770<br>Fax: 770-92<br>Web: www.<br>dy<br>22/AASHTO<br>th Double Sep<br>et Sample &<br>y Sample &<br>rre, g<br>ontent, %<br>et Finer Porti                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 23-8973<br>test-llc.com<br>Lab. PR. #<br>S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | STM D6913 an<br>ontent of FINE<br>1st Subsample<br>391.9<br>343.8<br>72.7<br>17.7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | RPORTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | k<br>as Company                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | RI<br>06/20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| Standard Test Me<br>Standard Test Me<br>s-Received Moisi<br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare, g | ENGIN<br>SOIL<br>TESTS<br>2088<br>North Plant MGP 3<br>13794/Composite<br>athod for Particle-<br>ture Content (Tota<br>3618.4<br>2824.6<br>228.6<br>30.6<br>228340<br>9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NEERIN<br>, LLC<br>3/6.0<br>Site -ISS Tr<br>Area A, B,<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | eatability Stu<br>C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of Ta<br>Dry Mass, of Ta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Phone: 770<br>Fax: 770-92<br>Web: www.<br>dy<br>22/AASHTO<br>th Double Sep<br>et Sample &<br>y Sample &<br>rre, g<br>ontent, %<br>et Finer Porti                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -938-8233<br>23-8973<br>test-llc.com<br>Lab. PR. #<br>S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | STM D6913 ar<br>ontent of FINE<br>1st Subsample<br>391,9<br>343,8<br>72,7<br>17,7<br>1st Subsample<br>2070.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bul<br>Forth Shore G<br>ad Hydromete<br>R PORTION<br>2nd Subsample<br>374.20<br>329.70<br>74.00<br>17.4<br>2nd Subsample<br>110.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Date<br>Checked By<br>D2-1<br>k<br>as Company<br>r Analysis)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 06/20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Standard Test Me<br>Standard Test Me<br>s-Received Moisi<br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare, g | SOIL<br>TESTS<br>2086<br>North Plant MGP 3<br>13794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/Composite<br>213794/ | , LLC<br>3/6.0<br>Site -ISS Tr<br>Area A, B,<br>Size Analysi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | eatability Stu<br>C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of Ta<br>Dry Mass, of Ta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Fax: 770-92<br>Web: www.<br>dy<br>22/AASHTO<br>th Double Seg<br>et Sample &<br>y Sample &<br>re, g<br>ontent, %<br>et Finer Porti                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 23-8973<br>test-llc.com<br>Lab. PR. #<br>S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | STM D6913 ar<br>ontent of FINE<br>1st Subsample<br>391,9<br>343,8<br>72,7<br>17,7<br>1st Subsample<br>2070.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bul<br>Forth Shore G<br>ad Hydromete<br>R PORTION<br>2nd Subsample<br>374.20<br>329.70<br>74.00<br>17.4<br>2nd Subsample<br>110.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Date<br>Checked By<br>D2-1<br>k<br>as Company<br>r Analysis)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 06/20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Standard Test Me<br>Standard Test Me<br>s-Received Moisi<br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare, g | TESTS           2066           North Plant MGP 3           13794/Composite           athod for Particle-           ure Content (Total           3618.4           2824.6           228.6           30.6           9           0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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                                                                                                                                                                                                                                                                                                                                                                                                                                                    | C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of W<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of W<br>Mass of Ta<br>Dry Mass,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Web: www.<br>dy<br>22/AASHTO<br>th Double Sey<br>et Sample &<br>y Sample &<br>rre, g<br>ontent, %<br>et Finer Porti<br>rre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | test-llc.com<br>Lab. PR. #<br>S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | STM D6913 ar<br>ontent of FINE<br>1st Subsample<br>391,9<br>343,8<br>72,7<br>17,7<br>1st Subsample<br>2070.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bul<br>Forth Shore G<br>ad Hydromete<br>R PORTION<br>2nd Subsample<br>374.20<br>329.70<br>74.00<br>17.4<br>2nd Subsample<br>110.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Checked By<br>02-1<br>k<br>as Company<br>r Analysis)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 06/20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Standard Test Mo<br>s- <i>Received Moisi</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare,               | TESTS           2066           North Plant MGP 3           13794/Composite           athod for Particle-           ure Content (Total           3618.4           2824.6           228.6           30.6           9           0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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                                                                                                                                                                                                                                                                                                                                                                                                                                                    | C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of W<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of W<br>Mass of Ta<br>Dry Mass,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Web: www.<br>dy<br>22/AASHTO<br>th Double Sey<br>et Sample &<br>y Sample &<br>rre, g<br>ontent, %<br>et Finer Porti<br>rre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | test-llc.com<br>Lab. PR. #<br>S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | STM D6913 ar<br>ontent of FINE<br>1st Subsample<br>391,9<br>343,8<br>72,7<br>17,7<br>1st Subsample<br>2070.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bul<br>Forth Shore G<br>ad Hydromete<br>R PORTION<br>2nd Subsample<br>374.20<br>329.70<br>74.00<br>17.4<br>2nd Subsample<br>110.40                                                                                                              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| Standard Test Mo<br>s- <i>Received Moisi</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare,               | 2086<br>North Plant MGP 3<br>13794/Composite<br>thod for Particle-<br>ure Content (Tota<br>3618.4<br>2824.6<br>228.6<br>30.6<br>228340<br>9<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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                                                                                                                                                                                                                                                                                                                                                                                                                                                    | C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of W<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of W<br>Mass of Ta<br>Dry Mass,                                                                                                                                                                                                                                                                                                                                                                                                                                             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                                                                                   | Lab. PR. #<br>S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | STM D6913 ar<br>ontent of FINE<br>1st Subsample<br>391,9<br>343,8<br>72,7<br>17,7<br>1st Subsample<br>2070.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bul<br>Forth Shore G<br>ad Hydromete<br>R PORTION<br>2nd Subsample<br>374.20<br>329.70<br>74.00<br>17.4<br>2nd Subsample<br>110.40                                                                                              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| Standard Test Mo<br>s- <i>Received Moisi</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare,               | North Plant MGP 5<br>13794/Composite<br>athod for Particle-<br><i>ure Content (Tota</i><br>3618.4<br>2824.6<br>228.6<br>30.6<br>226340<br>9<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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                                                                                                                                                                                                                                                                                                                                                                                                                                                    | C, D)<br>ASTM D 42<br>is of Soils (with<br>Mass of W<br>Mass of Dr<br>Mass of Ta<br>Moisture C<br>Mass of W<br>Mass of Ta<br>Dry Mass,                                                                                                                                                                                                                                                                                                                                                                                                                                             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                                                                                   | S. Type<br>Depth/Elev.<br>Add. Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | STM D6913 ar<br>ontent of FINE<br>1st Subsample<br>391,9<br>343,8<br>72,7<br>17,7<br>1st Subsample<br>2070.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Bul<br>Forth Shore G<br>ad Hydromete<br>R PORTION<br>2nd Subsample<br>374.20<br>329.70<br>74.00<br>17.4<br>2nd Subsample<br>110.40                                                                                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| s- <i>Received Mois</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>ample before<br>/8" sieve & Tare,                                     | ethod for Particle-<br>ure Content (Tota<br>3618.4<br>2824.6<br>228.6<br>30.6<br>226340<br>9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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Info<br>T 88<br>paration per A<br><i>Moisture Co</i><br>Tare, g<br>Tare, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| s- <i>Received Mois</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>ample before<br>/8" sieve & Tare,                                     | g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| s- <i>Received Mois</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>ample before<br>/8" sieve & Tare,                                     | g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| s- <i>Received Mois</i><br>ample & Tare, g<br>ample & Tare, g<br>nt, %<br>ample before<br>/8" sieve & Tare,                                     | g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare,                                                               | 3618.4<br>2824.6<br>228.6<br>30.6<br>226340<br>9<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| ample & Tare, g<br>ample & Tare, g<br>nt, %<br>Sample before<br>/8" sieve & Tare,                                                               | 3618.4<br>2824.6<br>228.6<br>30.6<br>226340<br>9<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| ample & Tare, g<br>nt, %<br>ample before<br>/8" sieve & Tare,                                                                                   | 2824.6<br>228.6<br>30.6<br>226340<br>9<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| ant, %<br>Sample before<br>/8" sieve & Tare,                                                                                                    | 228.6<br>30.6<br>226340<br>9<br>0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| nt, %<br>Sample before<br>/8" sieve & Tare,                                                                                                     | 30.6<br>226340<br>g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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|                                                                                                                                                 | 0.1           Sample 8           COBBLES         0.           740           COARSE         278           GRAVEL         384           565         873           I200         2655           WE GRAVEL         2037           2555         2555           MARSE SAND         165           St Subsample of         60           RANALYSIS         169           ion Period         rsion Device 1D #           sing Agent (ml)         assumed)           ested)         51           10:54         2           10:57         15           11:07         14           11:52         60           15:02         255           10:52         144                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.00           Sample & Tare, g % RETAINED           COBBLES         0.0         0           740.0         0           COARSE         2784.0         2           GRAVEL         3848.0         2           SGRAVEL         3848.0         2           SGRAVEL         3848.0         2           SGRAVEL         3848.0         2           SGRAVEL         20376.0         12           26551.0         15           ARSE SAND         165.9         9           St Subsample of Finer Portion         61           sing Agent (ml)         125.0           assumed)         2.650           ested)         10:52           Time         Testing time<br>(min)           10:57         5         9.0           11:07         15         8.0           11:22         30         7.0           11:52         60         6.0           15:02         250         5.0           10:52         1440         5.0 | Sample & Tare, g         % RETAINED         (of Total)           COBBLES         0.0         0         100           COBBLES         0.0         0         100           COBRES         2.0         0         100           COARSE         2784.0         2         98           GRAVEL         3848.0         2         98           5650.0         3         97           8737.0         5         95           NE GRAVEL         20376.0         12         88           25551.0         15         85           ARSE SAND         165.9         9         77           St Subsample of Finer Portion<3/8'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | RTION OF SAMPLE (RETAINED ON 3/8" S/EVE)       2nd Subs         0.00       % PASSING         Sample & Tare, g. % RETAINED (of Total)       (of Total)         COBBLES       0.0       0       100         COBBLES       0.0       0       100         COARSE       2784.0       2       98         GRAVEL       3848.0       2       98         5650.0       3       97         8737.0       5       95         12803.0       7       93         NE GRAVEL       20376.0       12       88         25551.0       15       85         ARSE SAND       165.9       9       77         St Subsample of Finer Portion<3/8" | RTION OF SAMPLE (RETAINED ON 3/8" SIEVE)         2nd Subsample of FINE           0.00         % RETAINED         (d Total)           COBBLES         0.0         0         100           COARSE         2764.0         2         98         #10           GRAVEL         3848.0         2         98         #20           5650.0         3         97         #40           8737.0         5         95         #60           12903.0         7         93         #100           VE GRAVEL         20551.0         15         85           ARSE SAND         165.9         9         77           St Subsample of Finer Portion         7/8"         % COBBLES           Sing Agent (ml)         2.650         % COARSE GRAVEL           % COARSE SAND         10:52         % COARSE SAND           10:52         0.01230         4.0           10:54         2         10.0         29.3         0.01230         4.0           10:57         5         9.0         29.3         0.01230         4.0           11:07         15         8.0         29.3         0.01230         4.0           11:07         15         8.0 | RTION OF SAMPLE (RETAINED ON 3/8" SIEVE)         2nd Subsample of FINER PORTION OF           0.00         % PASSING           Sample & Tare, g. % RETAINED         (of tota)           COBBLES         0.0         100           740,0         0         100           GRAVEL         3848,0         2         98           #10         MEDIUM         SAND           SGRAVEL         3848,0         2         98           \$650,0         3         97         #40           B737,0         5         95         #60           12003,0         7         93         #100           VE GRAVEL         20376,0         12         88         #200           Z5551,0         15         85         9         77           St Subsample of Finer Portion<3/8" | RTION OF SAMPLE (RETAINED ON 3/8" SIEVE)         2nd Subsample of FINER PORTION OF SAMPLE (PAS           O.00         % PASSING         Cumulative         Cumulative           Sample & Tare, g * % RETAINED         (rt Tota)         Cumulative         Mass retained, g           COBBLES         0.0         0         100         Sieve Size         Mass retained, g           COMARSE         2764.0         2         98         #10         MEDIUM         6.30           GRAVEL         3848.0         2         98         #20         SAND         14.80           S660.0         3         97         #40         SAND         14.80         33.58           WE GRAVEL         20376.0         12         88         #200         FINE SAND         13.58           VE GRAVEL         20376.0         12         88         #200         FINES         85.03           RASE EAND         165.9         9         77         St Subsample of Finer Portion         70         % COBBLES         0         % MEDIUM SA           sing Agent (m1)         225.0         % FINE GRAVEL         7         % FINE SAND         % FINE SAND           10:52         15         9.0         29.3         0.01230 | RTION OF SAMPLE (RETAINED ON 3/8" SIEVE)         2nd Subsample of FINER PORTION OF SAMPLE (PASSING #4 SIEV           COBBLES         0.0         0         100         % PASSING           Sample & Tare, g. % RETAINED         (of Total)         Cumulative         % PASSING           COBBLES         0.0         0         100         Sieve Size         Cumulative         % PASSING           COARSE         2784.0         2         98         #10         Mesoretained, g         (of Total)           COARSE         2784.0         2         98         #10         Mesoretained, g         (of Total)           COARSE         2784.0         2         98         #20         Mesoretained, g         (of Total)           COARSE         2784.0         2         98         #20         Mesoretained, g         (of Total)           COARSE         20376.0         12         88         #20         FINE SAND         83.58         9           VE CRAVEL         20376.0         12         81         #20         FINE SAND         85.03         7           St Subsample of Finer Portion         2551.0         15         85         9         77         85         EMEDIUM SAND           sign gare | RTION OF SAMPLE (RETAINED ON 3/8" SIEVE)           2nd Subsample of FINER PORTION OF SAMPLE (PASSING #4 SIEVE:Hydrometer 1           Sample & Tare, g * % RETANED         (of Total)           COBBLES         0.0         0         100           740.0         0         100         Cumulative         % PASSING           Commutative         % RETAINED         (of Total)         Cumulative         % PASSING           Commutative         % PASSING           Commutative         % PASSING         Mass metained, g         (of Total)           Commutative         % PASSING           Game         #10         Mass metained, g         (of Total)           Silve Size         Cumulative         % PASSING           MECRAVEL         384.0         Cumulative         % PASSING           Gave         #20         #33         #20         Fines Sand         7           Site Substrained, g         (of Total)         11.0         35         9           Time Sand         165.0         % COBBLES         % MEDIUM SAND         13           Sig Agent (mi) <th colsp<="" td=""></th> |  |

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|----------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------------------|--------------------|----------------------------------------------|----------------------------------------------------|--------------|-------------------|-----------------------------------|---------------------------------------|-------------------------------|---------------------------------------------------------|----------|--|
|                                                                            |                                       |                   | Тіме                                  |                    |                                              | 1874 Forg                                          | e Street     | Tucke             | r, GA 300                         | )84                                   |                               |                                                         |          |  |
| 1                                                                          | <u>TÈ</u>                             | <u>ST.</u>        | ENGI                                  | VEERING            |                                              | Phone: 77                                          | 0-938-8:     | 233               |                                   |                                       | Ъ.                            | Tested By                                               | EB       |  |
|                                                                            |                                       |                   | Soil                                  |                    |                                              | Fax: 770-9                                         | 923-8973     | 3                 | Ą                                 |                                       | ι.                            | Date                                                    | 06/22/12 |  |
|                                                                            | <u>[</u>                              | 1                 | TESTS                                 | , LLC              |                                              | Web: <u>ww</u>                                     | v.test-lic.  | <u>com</u>        |                                   |                                       |                               | Checked By                                              | 18       |  |
| Client Pr. #                                                               |                                       |                   |                                       | 3/6.0              |                                              |                                                    | -            | PR. #             |                                   |                                       | .123                          | 30-02-1                                                 |          |  |
| Pr. Name                                                                   | Fo                                    |                   |                                       | Site -ISS Treat    |                                              | tudy                                               | -            | . Type            |                                   |                                       |                               | Bulk                                                    |          |  |
| Sample ID<br>Location                                                      | <u> </u>                              | 137               | 94/Composite                          | e Area A, B, C,    | D)                                           |                                                    | Depth<br>Add | d. Info           |                                   | North                                 | Shore                         | -<br>Gas Company                                        |          |  |
|                                                                            | L                                     |                   |                                       |                    |                                              |                                                    |              |                   |                                   |                                       |                               |                                                         |          |  |
|                                                                            | Stand                                 | lard Test         | Method for                            | Liquid Limit,      |                                              | TM D 4318<br>: Limit, an                           |              | city Ind          | lex of So                         | ils (Atte                             | rberg                         | Limits)                                                 |          |  |
| Number of B<br>Weight of W<br>Weight of Dr<br>Weight of Ta<br>Moisture Cor | et Sample &<br>y Soil & Tar<br>ire, g |                   |                                       | 42.06 4<br>25.40 2 | MIT<br>7<br>52.30<br>48.38<br>29.35<br>20.60 |                                                    |              | ר<br>ר<br>נ       | NOTES:<br>Nonplasti<br>.imit test | c. (Liquid<br>could not<br>il passing | ial app<br>1 Limit<br>t be pe | pears to be<br>or Plastic<br>erformed.)<br>40 sieve was | 56       |  |
|                                                                            | 58                                    |                   |                                       |                    |                                              |                                                    |              |                   |                                   |                                       |                               | 1                                                       |          |  |
|                                                                            | 57                                    |                   |                                       | [                  |                                              |                                                    | ,            |                   |                                   |                                       |                               | 1                                                       | -        |  |
|                                                                            | 56                                    |                   |                                       |                    |                                              |                                                    |              | ļ                 |                                   |                                       |                               | ļ                                                       |          |  |
| × 4                                                                        |                                       | · ·               |                                       |                    | •                                            |                                                    |              |                   | ·                                 | }                                     |                               |                                                         |          |  |
| EN                                                                         | 55                                    |                   | ·                                     | NO                 | NPL                                          | ASTIC                                              |              |                   |                                   |                                       |                               | · ·                                                     |          |  |
| STURE (                                                                    | 53                                    |                   |                                       | <b> </b>           |                                              |                                                    |              |                   |                                   |                                       |                               |                                                         |          |  |
| SIOW                                                                       | 52                                    |                   | · · · · · · · · · · · · · · · · · · · |                    |                                              | ·                                                  |              |                   |                                   |                                       | -                             |                                                         |          |  |
|                                                                            |                                       |                   |                                       | • •                |                                              |                                                    |              | }                 |                                   |                                       |                               |                                                         |          |  |
|                                                                            | 51                                    |                   |                                       |                    |                                              |                                                    |              |                   |                                   |                                       |                               |                                                         |          |  |
|                                                                            | 50                                    |                   |                                       | I                  |                                              |                                                    |              | <u> </u>          | اا                                | L                                     | <u> </u>                      | 1                                                       |          |  |
|                                                                            | 10                                    |                   | 2                                     | 0                  | 30                                           | 40                                                 |              |                   |                                   |                                       | 1                             | 00                                                      |          |  |
|                                                                            |                                       |                   |                                       | NU                 | MBER O                                       | F BLOWS                                            |              |                   |                                   |                                       |                               | •                                                       |          |  |
|                                                                            |                                       |                   |                                       | PLASTIC L          | IMIT                                         |                                                    |              |                   |                                   |                                       |                               |                                                         |          |  |
| Weight of W                                                                |                                       | -                 |                                       | 43.78              | 42.27                                        |                                                    | PREPA        | RATIO             | N PROC                            | EDURE                                 |                               | DRY                                                     |          |  |
| Weight of Dr                                                               | -                                     | e, g              |                                       | (                  | 38.94                                        |                                                    |              |                   |                                   |                                       |                               |                                                         |          |  |
| Weight of Ta<br>Moisture Cor                                               | -                                     |                   |                                       | ·                  | 23.58<br>21.68                               | 4                                                  |              |                   |                                   |                                       |                               |                                                         |          |  |
| Moistale Col                                                               | ntent, 70                             |                   |                                       | 21.41              | 21.00                                        | 1                                                  | Dalanu       | e ID Nu           | INDEL                             |                                       |                               | 2                                                       |          |  |
|                                                                            |                                       |                   | NATU                                  | IRAL MOISTUI       | RE                                           |                                                    |              |                   |                                   |                                       |                               | r <u></u>                                               |          |  |
| Weight of W<br>Weight of Dr                                                |                                       | -                 |                                       | 3618.40<br>2824.60 |                                              |                                                    |              | ILIMIT<br>IC LIMI |                                   |                                       |                               | NP<br>NP                                                |          |  |
| Weight of Ta                                                               | •                                     | e, y              | •                                     | 2024.00            |                                              |                                                    |              |                   | • •                               | )                                     |                               | NP                                                      |          |  |
| Moisture Co                                                                | =                                     |                   |                                       | 30.58              |                                              | PLASTICITY INDEX (PI) NP<br>LIQUIDITY INDEX (LI) - |              |                   |                                   |                                       |                               |                                                         |          |  |
| DESCRIPTIO                                                                 | NC                                    | Gray Po<br>Gravel | orly Graded S                         | and with Silt a    | nd .                                         | ]                                                  |              | <u>.</u> .        |                                   |                                       |                               |                                                         |          |  |
| USCS (ASTM                                                                 | D2487;2488                            | )                 | SP-SM                                 | ]                  |                                              | · .                                                | AASHT        | TO (M 14          | 45)                               |                                       | NA                            | ]                                                       |          |  |

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| 7 1                                    | TIMEL                 | Y                                   | 1874 Forge Stre                                                 | et Tucker, GA 3                       | 0084                                 |                                               | · · · · · · · · · · · · · · · · · · · |                            |          |  |  |
|----------------------------------------|-----------------------|-------------------------------------|-----------------------------------------------------------------|---------------------------------------|--------------------------------------|-----------------------------------------------|---------------------------------------|----------------------------|----------|--|--|
| TE. IST.                               | ENGIN                 | EERING                              | Phone: 770-938                                                  | -8233                                 |                                      |                                               |                                       | Tested By                  | RI       |  |  |
|                                        | Soil                  |                                     | Fax: 770-923-89                                                 | 73                                    | 174309122 1911                       |                                               |                                       | Date                       | 06/22/12 |  |  |
|                                        | Tests,                | LLC                                 | Web: <u>www.test-l</u>                                          | lc.com                                |                                      |                                               |                                       | Checked By                 | 18       |  |  |
| Client Pr. #                           |                       |                                     | 2088/6.0                                                        |                                       | Lab. PR. #                           |                                               |                                       | 30-02-1                    |          |  |  |
| , Pr. Name<br>Sample ID                |                       |                                     | BP Site -ISS Treat<br>Disite Area A, B, C                       |                                       | S. Type<br>Depth/Elev.               |                                               |                                       | Bulk                       |          |  |  |
| Location                               |                       | _107.94/00mpc                       |                                                                 |                                       | Add. Info                            |                                               | North Shore                           | Gas Company                |          |  |  |
|                                        | WET (BU               |                                     |                                                                 |                                       | ASTM D293                            | 7 Mod./D45                                    | 31/D883)                              |                            |          |  |  |
|                                        | ···=· (=•             |                                     | Mass of                                                         |                                       | T                                    |                                               | [                                     |                            |          |  |  |
| Sample ID                              | Moisture<br>Content.% | Mass of<br>Container, o             | Wet Sample                                                      | Volume of<br>Container, ml            | Volume of Container, ft <sup>3</sup> | Wet<br>Density, pcf                           | Dry<br>Density, pcf                   | Com                        | ments    |  |  |
| 3794/Composite (Area A,B,C,D)          | 30.6                  | 68.4                                | 1298.5                                                          | 690.0                                 | 0.024                                | 111.3                                         | 85.2                                  | <br>Materi                 | al<3/8"  |  |  |
|                                        |                       |                                     |                                                                 |                                       |                                      |                                               |                                       |                            |          |  |  |
| ······································ |                       |                                     |                                                                 |                                       |                                      | ·                                             |                                       | ······                     |          |  |  |
| · · · ·                                |                       |                                     |                                                                 |                                       |                                      |                                               |                                       |                            |          |  |  |
| · · · · · · · · · · · · · · · · · · ·  |                       |                                     |                                                                 | · ·                                   | ·                                    |                                               | · · · ·                               |                            |          |  |  |
|                                        |                       |                                     | }.                                                              |                                       |                                      |                                               |                                       |                            |          |  |  |
|                                        |                       |                                     |                                                                 |                                       |                                      |                                               |                                       |                            |          |  |  |
| · · · · · · · · · · · · · · · · · · ·  |                       |                                     | [                                                               |                                       |                                      | ·<br>                                         |                                       |                            |          |  |  |
|                                        |                       |                                     | }                                                               |                                       |                                      |                                               |                                       |                            |          |  |  |
|                                        |                       |                                     |                                                                 |                                       |                                      |                                               |                                       |                            |          |  |  |
|                                        |                       |                                     | · .                                                             |                                       |                                      |                                               |                                       | . <u> </u>                 |          |  |  |
|                                        |                       |                                     |                                                                 |                                       |                                      |                                               |                                       | . <u></u>                  |          |  |  |
|                                        |                       |                                     |                                                                 |                                       |                                      |                                               |                                       |                            |          |  |  |
|                                        |                       |                                     |                                                                 | · · · · · · · · · · · · · · · · · · · |                                      |                                               |                                       |                            |          |  |  |
| ·                                      |                       |                                     |                                                                 |                                       |                                      |                                               | · · · ·                               |                            |          |  |  |
| ·····                                  |                       |                                     |                                                                 |                                       | <br>                                 |                                               |                                       |                            |          |  |  |
|                                        |                       | Ca                                  | omments                                                         |                                       |                                      |                                               |                                       |                            |          |  |  |
|                                        | including voi         | y - the mass pe<br>ds inhèrent in t | er unit volume of r<br>the material as test<br>ceived condition | sted. Mass and                        |                                      | Balance ID Nu<br>Oven ID Num<br>Caliper ID Nu | ber                                   | 12/13/14/15<br>1/6/7<br>16 |          |  |  |
|                                        | l                     |                                     |                                                                 |                                       | <b>.</b> .                           | Calper D Nu                                   |                                       |                            | l l      |  |  |

## **APPENDIX B5**

# UNCONFINED COMPRESSIVE STREGNTH AND HYDRAULIC CONDUCTIVITY TESTING DATA



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### SUMMARY of TESTING

T.E.S.T. Project Number: 1230-02 Project Name: Former North Plant MGP Site

|          | Sample Ider     | tification |       |       | Admixtures |        |         | Dates    |           |        |          |          | Dur      | ability     | Volume   | Unit \   | Neight   | Hydraul. |
|----------|-----------------|------------|-------|-------|------------|--------|---------|----------|-----------|--------|----------|----------|----------|-------------|----------|----------|----------|----------|
| T.E.S.T. | Client          | Mix        |       |       | GGBFS/     | Cement | Benton. | Mixing   | Testing   | Curing |          | Moisture | Cum. Co  | r. Relative | Change   | Wet      | Dry      | Conduct  |
| Sample   | Base Material   | Design     | Batch | Spec. | Cem. (3/1) |        |         |          | [         | Age,   | ucs,     | Content, | Mass     | Loss, %     |          | Density, | Density, | ļ        |
| No.      | No.             | No.        | No.   | No.   | %          | %      | %       |          | ĺ         | days   | psi      | %        | Wet/Dry  | Fr./Thaw    | %        | pcf      | pcf      | cm/sec   |
|          |                 |            |       |       |            |        |         |          | 1230-02-1 |        |          |          |          |             |          | ±.—      |          |          |
| 13794    | Comp. (A,B,C,D) |            |       |       | -          | -      |         | _ '      |           | · _    | -        |          | -        | - 1         | -        | -        | -        | · ~      |
| 13794    | Comp. (A,B,C,D) | . 1        | 1     | 1     | 6          | -      | -       | 06/27/12 | 06/27/12  | 0      | -        | 32.9     |          |             | -        | -        | -        | _        |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 2     | 6          | -      | -       | 06/27/12 | NA        | NA     | -        | -        | -        | -           | -        | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 3     | 6          | -      | -       | 06/27/12 | NA        | _NA_   | -        | <u> </u> | ·        | ·           |          | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 4     | 6          | -      | -       | 06/27/12 | 07/27/12  | 30     | 257      | 27.8     | -        | _           |          | 111.9    | 87.6     | -        |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 5     | 6          |        | -       | 06/27/12 | NA        | NA     | -        | -        | -        |             |          | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 6     | 6          | -      | . –     | 06/27/12 | NA        | NA     | -        |          | -        | -           |          | -        | -        |          |
| 13794    | Comp. (A,B,C,D) | 1          | ·1    | 7     | 6          |        | -       | 06/27/12 | 07/27/12  | 30     |          | 26,5     | -        | <u> </u>    | •        | 111.6    | 88.2     | 5.6E-08  |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 8     | 6          | _      | -       | 06/27/12 | 06/30/12  | 3      |          |          | -        |             |          | <u> </u> |          |          |
| 13794    | Comp. (A,B,C,D) | 1.         | 1     | 9     | 6          |        |         | 06/27/12 | ANS16.1   | 34     | -        |          |          |             |          | · -      |          | <u> </u> |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 10-14 | 6          |        | -       | 06/27/12 | 07/31/12  | 34     | · _      | <u> </u> | X        |             |          | <u> </u> | · · -    |          |
| 13794    | Comp. (A,B,C,D) | 1          | 1     | 15-19 | 6          |        |         | 06/27/12 | 07/31/12  | 34     | -        |          | <u> </u> | x           |          |          |          |          |
| 13794    | Comp. (A,B,C,D) | 1          | _ 1_  | 20-26 | 6          |        |         | 06/27/12 | .07/31/12 | 34     | <u>-</u> |          |          | <u>`-</u>   | X        |          | -        | <u> </u> |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 1     | 8          |        |         | 06/27/12 | 06/27/12  | 0      | -        | 33.8     | <u> </u> |             |          | -        |          |          |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 2     | 8          | -      | -       | 06/27/12 | 07/04/12  | 7      | 112      | 29.5     |          |             |          | 112.5    | 86.9     |          |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 3     | 8          | -      |         | 06/27/12 | 07/11/12  | 14     | 229      | 28.2     |          |             | <u> </u> | 112.5    | 87.7     |          |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 4     | 8          | -      | -       | 06/27/12 | 07/25/12  | 28     | 313      | 28.2     |          |             | <u>-</u> | 111.8    | 87.2     | <u> </u> |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 5     | 8          | -      | _       | 06/27/12 | 07/04/12  | 7      |          | 26,8     | <u> </u> | -           |          | 113.1    | 89.2     | 1.1E-07  |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 6     | 8          | -      |         | 06/27/12 | 07/11/12  | 14     | · · -    | 26.1     | -        |             |          | 113.4    | 89.9     | 4.6E-08  |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 7     | 8          |        | -       | 06/27/12 | 07/25/12  | 28     |          | 26.2     |          | -           |          | 111.7    | 88.5     | 2.2E-08  |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 8     | 8          |        |         | 06/27/12 | 06/30/12  | 3      |          |          | -        |             |          |          | -        |          |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 9     | 8          | -      | -       | 06/27/12 | ANS16.1   | 34     | -        | -        | -        | -           |          | ·        | · -      | -        |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 10-14 | 8          | -      |         | 06/27/12 | 07/31/12  | 34     | •        | -        | x        | -           | -        | _        | _        | -        |
| 13794    | Comp. (A,B,C,D) | 2          | 1     | 15-19 | 8          |        | _       | 06/27/12 | 07/31/12  | 34     | -        | -        | -        | x           | -        | -        | -        | 1 -      |

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TIMELY 1874 Forge Street Tucker, GA 30084

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## SUMMARY of TESTING

### T.E.S.T. Project Number: 1230-02

### DRAFT

Project Name: Former North Plant MGP Site

|          | Sample Ider     | ntification | 1     |              | A          | dmixture | 5       | Da       | tes      |        |          | <u> </u> | Dura     | ability    | Volume   | Unit \   | Neight   | Hydraul. |
|----------|-----------------|-------------|-------|--------------|------------|----------|---------|----------|----------|--------|----------|----------|----------|------------|----------|----------|----------|----------|
| T.E.S.T. | Client          | Mix         |       |              | GGBFS/     | Cement   | Benton. | Mixing   | Testing  | Curing |          | Moisture | Cum. Cor | . Relative | Change   | Wet      | Dry      | Conduct. |
| Sample   | Base Material   | Design      | Batch | Spec.        | Cem. (3/1) |          |         |          |          | Age,   | UCS,     | Content, | Mass     | Loss, %    |          | Density, | Density, |          |
| No.      | No.             | No.         | No.   | No.          | %          | %        | %       |          |          | days   | psi      | %        | Wet/Dry  | Fr./Thaw   | %        | pcf      | pcf      | cm/sec   |
| 13794    | Comp. (A,B,C,D) | 2           | 1     | 20-26        | 8          | -        | -       | 06/27/12 | 07/31/12 | 34     | - '      | -        | -        | -          | ×        | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 1.           | 10         | -        | -       | 06/27/12 | 06/27/12 | 0      | · _      | 35.8     | -        | -          | -        | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 2            | 10         |          | -       | 06/27/12 | NA       | NA     | -        | -        | -        | -          | -        | - 1      | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | . 3          | 10         | -        | -       | 06/27/12 | NA       | NA     | -        | -        | -        | -          | -        | ``-      | -        |          |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 4            | 10         | -        | -       | 06/27/12 | NA       | NA     | -        | -        | -        | -          | -        | -        |          | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 5            | 10         | -        | -       | 06/27/12 | NA       | NA     | -        |          | -        | -          | -        |          | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 6            | 10         | -        | -       | 06/27/12 | NA       | NA     | -        | -        | -        | -          | -        | - ·      | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 7            | <u>10</u>  | -        | -       | 06/27/12 | NA       | NA     | -        | -        | -        |            | -        | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 8            | · 10       | -        | -       | 06/27/12 | 06/30/12 | 3      | -        | -        | _        | -          | -        | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 9            | 10         | -        | -       | 06/27/12 | ANS16.1  | >28?   | -        | -        | -        | -          | -        | -        |          | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 10-14        | 10         | _        | -       | 06/27/12 | ???      | >28?   |          | ·        | <br>x?   | -          | -        | -        |          | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 15-19        | 10         | -        |         | 06/27/12 | ???      | >28?   | -        | -        | -        | x?         | -        | -        | -        | -        |
| 13794    | Comp. (A,B,C,D) | 3           | 1     | 20-26        | 10         | -        |         | 06/27/12 | 07/25/12 | 28     | -        | •        | · -      |            | x?       | -        |          | -        |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 1            |            | 8        | 0,5     | 06/26/12 | 06/26/12 | 0      |          | 36.3     | -        | · <b>-</b> |          |          |          | -        |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 2            |            | 8        | 0.5     | 06/26/12 | NA       | NA     | -        |          |          | -          |          |          | -        |          |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 3            |            | 8        | 0.5     | 06/26/12 | NA       | NA     | -        |          | -        |            | -        | -        |          |          |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 4            |            | 8        | 0.5     | 06/26/12 | NA       | NA     | -        | -        | -        | -          | <u> </u> |          |          | · _      |
| 13794    | Comp. (A,B,C,D) | 4           | _1    | 5            |            | · 8      | 0.5     | 06/26/12 | NA       | NA_    | -        |          | -        | •          | -        |          | -        |          |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 6            | -          | 8        | 0.5     | 06/26/12 | NA       | NA     | <u> </u> |          | -        |            |          | <u> </u> | <u> </u> |          |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 7            | -          | 8.       | 0.5     | 06/26/12 | NA       | NA     |          |          | -        | -          | -        | -        | <u> </u> |          |
| 13794    | Comp. (A,B,C,D) | 4           | _ 1_  | Ŗ            |            | 8        | 0.5     | 06/26/12 | 06/29/12 | 3      | _ · _    |          |          |            |          | -        | <u> </u> |          |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 9            |            | 8        | 0.5     | 06/26/12 | ANS16.1  | >28?   | -        |          | -        |            | -        |          |          | ·        |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | <u>10-14</u> |            | 8        | 0.5     | 06/26/12 | ???      | >28?   |          | <u> </u> | x?       |            | <u> </u> | -        |          | <b>.</b> |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 15-19        | -          | 8        | 0.5     | 06/26/12 | ???      | >28?   | -        | <u> </u> |          | x?         | <u> </u> |          | <u> </u> |          |
| 13794    | Comp. (A,B,C,D) | 4           | 1     | 20-26        | -          | 8        | Û.5     | 06/26/12 | 07/24/12 | 28     | -        | -        | <u> </u> | -          | x?       | <u> </u> | <u> </u> |          |



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### SUMMARY of TESTING

#### T.E.S.T. Project Number: 1230-02

Project Name: Former North Plant MGP Site

#### Sample Identification Admixtures Dates Durability Volume Unit Weight Hydraul. T.E.S.T. Client Mix GGBFS/ Cement Benton Testing Curing Cum. Cor. Relative Change Wet Dry Conduct. Mixing Moisture **Base Material** Design Batch Spec. Cem. (3/1) Sample UCS. Content, Mass Loss, % Density, Density, Age, No. % Wet/Dry Fr./Thaw % pcf pcf No. No. No. % % % psi No. days cm/sec Comp. (A,B,C,D) 13794 1 1 0.5 06/26/12 06/26/12 0 34.3 5 -10 -Comp. (A,B,C,D) 13794 5 1 2 10 0.5 06/26/12 07/03/12 7 49 29.1 111.6 86.4 . ----13794 Comp. (A,B,C,D) 3 14 5 1 10 0.5 06/26/12 07/10/12 56 29.9 110.4 85.0 -Comp. (A,B,C,D) 13794 5 4 10 0.5 06/26/12 07/24/12 28 72 28.8 109.9 85.2 1 ---Comp. (A,B,C,D) 13794 5 7 5 1 .... 10 0.5 06/26/12 07/03/12 . 26.9 110.9 87.4 7.6E-06 -**.** . -13794 Comp. (A,B,C,D) 5 6 06/26/12 07/10/12 14 28.4 1 10 0,5 112.4 87.5 5.0E-06 -~ ---13794 Comp. (A,B,C,D) 5 7 0.5 06/26/12 07/24/12 28 26.2 113.3 89.8 1 10 2.9E-06 -. ---Comp. (A,B,C,D) 13794 5 8 0.5 06/26/12 06/29/12 3 1 -10 ----\_ ---Comp. (A,B,C,D) 13794 5 9 >28? 1 10 0.5 06/26/12 ANS16.1 .... .... -13794 Comp. (A,B,C,D) 5 0.5 06/26/12 ??? >28? х? 1 10-14 ..... 10 -. --\_ -Comp. (A,B,C,D) 13794 5 10 0.5 06/26/12 **?**?? >28? x? 1 15-19 -------13794 Comp. (A,B,C,D) 5 1 20-26 10 0.5 06/26/12 07/24/12 28 x? --\_ \_ -Comp. (A,B,C,D) 13794 6 1 8 1 06/26/12 06/26/12 0 35.9 1 ---\_ -Comp. (A,B,C,D) 13794 2 NA 6 1 -8 1 06/26/12 NA -\_ \_ \_ ---\_ Comp. (A,B,C,D) 13794 6 1 3 8 1 06/26/12 NA-NA -.... --13794 Comp. (A;B,C,D) 4 06/26/12 NA 6 8 NA 1 -1 -\_ \_ \_ -Comp. (A,B,C,D) 13794 5 6 1 -8 1 06/26/12 NA NA \_ - 1 ---\_ -\_ Comp. (A,B,C,D) 13794 6 1 6 -8 1 06/26/12 NA NA -\_ --13794 Comp. (A,B,C,D) 7 в 1 8 1 06/26/12 NA NA -----Comp. (A,B,C,D) 13794 8 6 1 8 1 06/26/12 06/29/12 3 --. Comp. (A,B,C,D) 13794 6 1 9 8 1 06/26/12 ANS16.1 >28? -----. ---Comp. (A,B,C,D) 13794 6 1 10-14 8 1 06/26/12 ??? >28? x? ---... -\_ --Comp. (A,B,C,D) 13794 ??? 6 06/26/12 >28? x? 1 15-19 8 1 --. --13794 Comp. (A,B,C,D) x? 6 1 20-26 8 1 06/26/12 07/24/12 28 ----. --13794 Comp. (A,B,C,D) 7 1 10 1 06/26/12 06/26/12 0 34.1 1



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#### SUMMARY of TESTING

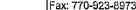
T.E.S.T. Project Number: 1230-02

Project Name: Former North Plant MGP Site Volume Sample Identification Admixtures Dates Durability Unit Weight Hydraul. T.E.S.T. Client Cement Benton. Mix **GGBFS** Mixing Testing Cum, Cor, Relative Curing Moisture Change Wet Conduct. Dry Sample **Base Material** Design Batch Spec. Cem. (3/1) UCS, Content. Mass Loss. % Age, Density, Density No. Wet/Dry Fr./Thaw No. No. No. No. % % % days psi % % pcf pcf cm/sec Comp. (A,B,C,D) 13794 2 07/03/12 7 1 10 1 06/26/12 7 45 30.8 110,9 84.7 -13794 Comp. (A,B,C,D) 7 3 1 10 1 06/26/12 07/10/12 14 55 30.4 -111.9 85.8 \_ --Comp. (A,B,C,D) 13794 7 1 4 10 1 06/26/12 07/24/12 28 67 29.4 110.1 85.1 --.... ... ..... 13794 Comp. (A,B,C,D) 7 5 10 06/26/12 07/03/12 7 27.3 1 1 ----111.5 87.6 5.1E-06 13794 Comp. (A,B,C,D) 7 1 6 10 1 06/26/12 07/10/12 14 28.3 112.4 87.6 3.3E-06 -13794 Comp. (A,B,C,D) 7 1 7 10 1 06/26/12 07/24/12 28 28.0 111.1 86.8 2.0E-06 -----Comp. (A,B,C,D) 13794 7 1 8 10 1 06/26/12 06/29/12 3 -- . -. -\_ Comp. (A,B,C,D) 13794 7 9 >28? 1 06/26/12 AN\$16.1 10 1 ---Comp. (A,B,C,D) 13794 7 1 10-14 10 1 06/26/12 ??? >28? ... x? ------Comp. (A,B,C,D) 13794 7 06/26/12 ??? >28? ÷ х? 1 15-19 10 1 -13794 Comp. (A,B,C,D) 7 06/26/12 07/24/12 1 20-26 10 28 x? 1 -----\_ 13794 Comp. (A,B,C,D) 8 1 1 6 -0.5 06/28/12 06/28/12 0 -33.2 \_ -\_ --Comp. (A,B,C,D) 13794 2 NA 8 1 6 0.5 06/28/12 NA ------Comp. (A,B,C,D) 13794 8 1 3 6 0.5 06/28/12 NA NA --13794 Comp. (A,B,C,D) 8 4 6 06/28/12 07/27/12 29 237 29.5 110.4 85.2 1 - · 0.5 ----13794 Comp. (A,B,C,D) 8 5 6 0.5 06/28/12 NA NA 1 . --\_ \_ -\_ --Comp. (A,B,C,D) 13794 6 8 1 6 0.5 06/28/12 NA NA -------Comp. (A,B,C,D) 13794 8 1 7 6 0.5 06/28/12 07/27/12 29 28.0 110.7 86.5 2.0E-08 --13794 Comp. (A,B,C,D) 8 1 8 6 0.5 06/28/12 07/01/12 3 ---------13794 Comp. (A,B,C,D) 8 1 9 6 0.5 06/28/12 ANS16.1 >28? -. ------Comp. (A,B,C,D) 13794 >28? x? 6 06/28/12 ??? 8 1 10-14 -0.5 --13794 Comp. (A,B,C,D) 06/28/12 ??? >28? x? 8 6 0.5 1 15-19 -------Comp. (A,B,C,D) 13794 8 1 20-26 6 0.5 06/28/12 07/26/12 28 x? ------13794 Comp. (A,B,C,D) 06/28/12 9 8 0,5 06/28/12 0 33.5 1 1 ------13794 Comp. (A,B,C,D) 2 129 9 1 8 0.5 06/28/12 07/05/12 7 31.5 110.9 84.3 \_ ---



#### TIMELY 1874 Forge Street Tucker, GA 30084

ENGINEERIN Phone: 770-938-8233 Sol



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TESTS, LLC Web: <u>www.test-llc.com</u>

DRAFT

### SUMMARY of TESTING

T.E.S.T. Project Number: 1230-02 Project Name: Former North Biant MGP Site

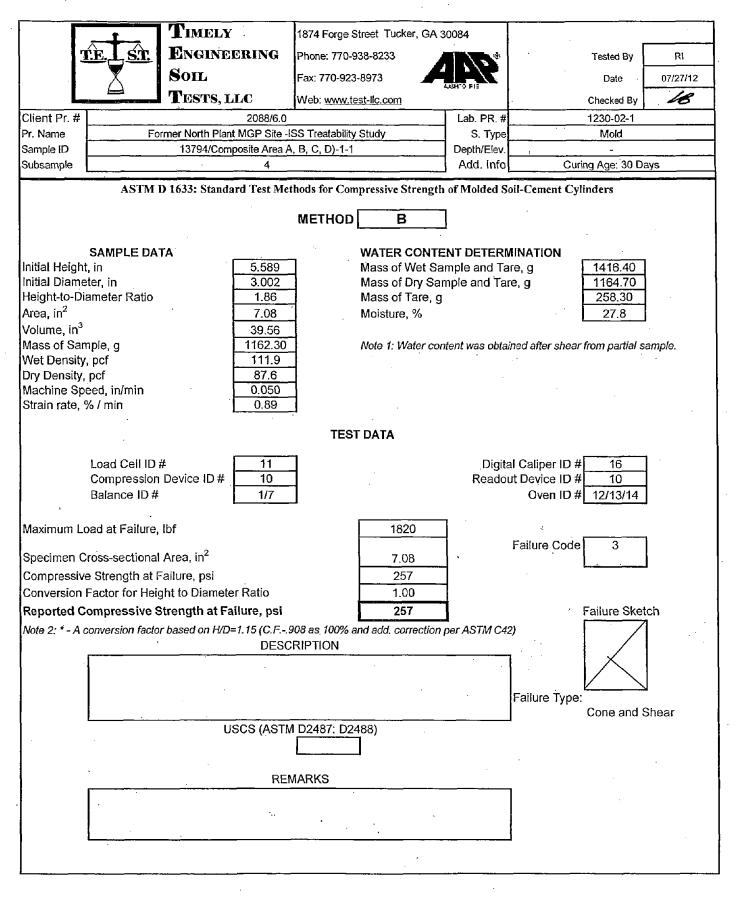
|          | lame: Former No<br>Sample Ider |        |       |        | Admixtures |            |         | Dates    |          | <u> </u> | ·    | Dura     | ability | Volume      | Unit V     | Veight   | Hydraul. |         |
|----------|--------------------------------|--------|-------|--------|------------|------------|---------|----------|----------|----------|------|----------|---------|-------------|------------|----------|----------|---------|
| T.E.S.T. | Client                         | Mix    | [     |        | GGBFS/     | Cement     | Benton. | Mixing   | Testing  | Curing   |      | Moisture | Cum. Co | r. Relative | Change     | Wet      | Dry      | Conduct |
| Sample   | Base Material                  | Design | Batch | Spec.  | Cem. (3/1) |            |         |          |          | Age,     | ucs, | Content, | Mass    | Loss, %     |            | Density, | Density, |         |
| No.      | No.                            | No.    | No.   | No.    | %          | %          | %       |          |          | days     | psi  | %        | Wet/Dry | Fr./Thaw    | %          | pcf      | pcf_     | cm/sec  |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 3      | 8          |            | 0.5     | 06/28/12 | 07/12/12 | 14       | 216  | 30.5     | -       | -           | •          | 111.8    | 85.7     | -       |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 4      | в          | •          | 0.5     | 06/28/12 | 07/26/12 | 28       | 296  | 29.7     | -       | -           | •          | 111.0    | 85.6     | _       |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 5      | 8          |            | 0.5     | 06/28/12 | 07/05/12 | 7        | -    | 27.0     |         | -           | •          | 112.9    | 88.9     | 9.0E-08 |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 6      | 8          |            | 0,5     | 06/28/12 | 07/12/12 | 14       | -    | 29.4     | -       |             | · _        | 109.6    | 84.7     | 2.5E-08 |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 7      | 8          | -          | 0.5     | 06/28/12 | 07/26/12 | 28       | · •  | 27.4     | -       | -           |            | 112.0,   | 87.9     | 1.5E-08 |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 8      | 8          | · •        | 0.5     | 06/28/12 | 07/01/12 | 3        | -    | -        | -       |             | -          |          |          | -       |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 9      | 8          | <u>-</u> - | 0,5     | 06/28/12 | ANS16.1  | >28?     | -    |          | -       | -           | -          |          |          | -       |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 10-14. | В          | -          | 0.5     | 06/28/12 | ???      | >28?     |      | _        | x?      | -           | -          | -        | -        | •       |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 15-19  | В          | -          | 0.5     | 06/28/12 | 377 .    | >28?     |      | -        | -       | · x?        | -          | -        | -        | -       |
| 13794    | Comp. (A,B,C,D)                | 9      | 1     | 20-26  | 8          | -          | 0.5     | 06/28/12 | 07/26/12 | 28       | · -  | · ц      | -       |             | x?         | _        | -        | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 1      | 10         | -          | 0.5     | 06/28/12 | 06/28/12 | 0        | -    | 35.0     | -       |             | _          | _        |          | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 2      | 10         |            | 0.5     | 06/28/12 | ' NA     | NA       | -    | -        | _       | -           | -          | _        |          | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 3      | 10         |            | 0.5     | 06/28/12 | NA       | NA       | -    | -        | -       |             | <b>_</b> · | _        | -        | _       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | · 4    | 10         | -          | 0.5     | 06/28/12 | NA       | NA       | -    | 1        | -       | ,           |            | _        |          | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 6      | 10         | -          | 0.5     | 06/28/12 | NA       | NA       | -    | -        | - 1     | -           | _          | _        |          | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | - 6    | 10         | -          | 0.5     | 06/28/12 | NA       | NĂ       | -    | -        | -       | -           | -          | -        | -        |         |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 7      | 10         |            | 0.5     | 06/28/12 | NA       | NA       | -    | -        | -       |             | -          | -        | -        | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 8      | 10         |            | 0.5     | 06/28/12 | 07/01/12 | 3        | -    | •        | -       | -           | -          | -        | -        | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 9      | 10         |            | 0.5     | 06/28/12 | ANS16.1  | >28?     | -    | -        | -       |             | -          | · -      | -        | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 10-14  | 10         | -          | 0.5     | 06/28/12 | ???      | >28?     | -    |          | x?      |             |            | -        | -        | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 15-19  | 10         |            | 0.5     | 06/28/12 | 777      | >28?     | ÷    |          | -       | x?          | -          |          |          | -       |
| 13794    | Comp. (A,B,C,D)                | 10     | 1     | 20-26  | 10         |            | 0.5     | 06/28/12 |          | 28       |      | _        |         |             | x?         | -        |          |         |

|                        |            |                  |                 |             |            |          |                      |                                |                   |                      |                      |                                   | • •                     |                        |                              |                      |
|------------------------|------------|------------------|-----------------|-------------|------------|----------|----------------------|--------------------------------|-------------------|----------------------|----------------------|-----------------------------------|-------------------------|------------------------|------------------------------|----------------------|
| - <u>.</u>             |            | <b>\$</b>        |                 | Тімеі       |            |          | 1874 Forg            | je Street Tu                   | cker, GA 3008     | <b></b><br>34        |                      | <u> </u>                          | <u> </u>                |                        |                              |                      |
|                        | TE.        | L <u> sr</u>     |                 | ENGIN       | IEERI      | NG       | Phone: 77            | 0-938-8233                     |                   |                      |                      |                                   |                         |                        | Tested By                    | EB                   |
| •                      |            | X                |                 | Soil        |            |          | Fax: 770-9           | 923-8973                       | A                 |                      |                      |                                   |                         |                        | Date                         | 07/27/12             |
|                        |            |                  |                 | TESTS       | , LLC      |          | Web: www             | v.test-ilc.com                 | 1000410           |                      |                      |                                   |                         |                        | Checked By                   | 18                   |
| Client Pr. #           |            |                  |                 |             |            | 88/6.0   | 1                    |                                |                   |                      | Lab. PR. #           |                                   |                         | 1230-02-1              |                              |                      |
| Pr. Name               |            |                  | For             | mer North P |            |          |                      |                                |                   |                      | S. Type              |                                   |                         | Mold                   |                              |                      |
| Sample ID              |            |                  | <u>·</u>        | 13794/C     | omposite   |          | <u>, B, C, D)-</u>   | 1-1                            |                   |                      | Depth/Elev.          |                                   |                         | -                      |                              |                      |
| Subsample              |            |                  |                 |             |            | 7        |                      |                                |                   |                      | Add. Info            | <u></u>                           | <u> </u>                | ing Age: 30 E          | Jays                         |                      |
|                        |            |                  |                 | ASTM D      |            |          |                      |                                |                   |                      |                      | ductivity of S<br>stant Rate of   | Saturated Poro<br>Flow) | us<br>                 |                              | •••                  |
| li                     | nitial Sa  | mple Dat         | a (Befor        | e Test)     | ļ          |          |                      | Test Dat                       | a                 |                      |                      |                                   | Final Data              | After Test             | )                            |                      |
| Height                 |            | 2.861            | in              | 7.27 0      | m Sp       | beed     |                      |                                | 13                | ]                    |                      |                                   | ·                       | -                      | <u></u>                      |                      |
| Diameter               |            | 3.009            | in              |             |            | bard NL  |                      |                                | 10                |                      |                      | ght of Sample                     | 2.858                   | in                     | 7.26 cm                      |                      |
| Area                   |            | <u> </u>         | in <sup>2</sup> |             | -          | eli Num  |                      |                                | 17                | 4                    | -                    | meter of Sample                   |                         | in ,                   | 7.62 cm                      |                      |
| Volume                 |            | 333.39<br>596.00 | cm <sup>3</sup> | 0.0118 f    |            |          | np Number<br>np Rate |                                | 2B<br>2.80E-05    | cm <sup>3</sup> /sec | Area<br>Volume       | 7.07 in <sup>2</sup><br>331.27 cm |                         | cm²<br>ft <sup>3</sup> | Day Dopaity                  | 89.0 pc              |
| Mass<br>Specific Gra   | wity       | 2,575            | 9<br>(Assumed   |             |            | - Value  | •                    |                                | 0.95              | 1011 7860            | Mass                 | 613.20 g                          | 1.35                    | lb                     | Dry Density<br>Vol. of Voids | 89.0 pc<br>147.82 cm |
| Dry Density            | -          | 88.2             | pcf             | - <b>'</b>  | 1          | ell Pres |                      |                                | 105.0             | psi                  |                      | <u> </u>                          | 1.00                    | 1.5                    | Vol. of Solids               | 183.45 cm            |
| · · <b>,</b> · · · · , | •          |                  | <b>T</b> 1,     |             | Ва         | ack Pre  | ssure                |                                | 90.0              | psi                  | ]                    |                                   |                         |                        | Void Ratio                   | 0.81                 |
|                        | Mois       | sture Coni       | tent            | _           | C          | onfining | (Effective)          | ) Pressure                     | 15.0 <sup>.</sup> | psi                  |                      | Moistu                            | re Content              | _                      | Saturation                   | 95.3 %               |
| Mass of we             | t sample & | tare             | 596.00          | 9           | M          | ax Hea   | d                    |                                | 68.93             | cm                   | Mass of wet          | sample & tare                     | 702.30                  | g                      | · · ·                        |                      |
| Mass of dry            | •          | tare             | 471.30          | a           |            | in Head  |                      |                                | 66.12             | cm                   | -                    | sample & tare                     | . 561.80                | a                      |                              |                      |
| Mass of tare           | 9          |                  | 0.00            | 9           | 1          |          | n Gradient           | •                              | 9.50              |                      | Mass of tare         |                                   | 90.50                   | 9                      |                              |                      |
| % Moisture             | FUNCT      |                  | 26.5            |             | يسا المسيح |          | Gradient             | 7                              | 9,11              |                      | % Moisture           | <u>.</u>                          | 29.8                    |                        |                              |                      |
| DATE                   | FUNCT      | MIN              | $\Delta t$      | READING     | He:        | •        | Gradient             | Temp.<br>T <sub>x</sub> ( °C ) |                   |                      | (cm/sec)<br>@ 20 °C  | INC                               | ote: Deaired Wate       |                        | ermeadility Test.            |                      |
|                        |            | {                | (sec)           | (psi)       |            |          |                      |                                | <u>x</u>          |                      |                      | N/                                | DESCRIPT                |                        | ٦.                           |                      |
| 07/22/12               | 10         | 0                |                 | 0.95        | 66.        |          | 9.21                 | 27.0                           | -<br>6.70E-08     | -                    |                      |                                   |                         |                        | 1                            | JSCS<br>D2487;2488)  |
| 07/22/12               | 10<br>10   | 10               | 600<br>600      | 0.94        | 66.<br>66. |          | 9.11<br>9.21         | <u>_27.0</u><br>27.0           | 6.70E-08          | 0.850                | 5.70E-08<br>5.70E-08 | ┨ │                               |                         |                        |                              | NA                   |
| 07/22/12               | 10         | 20<br>30         | 600             | 0.93        | 66.        |          | 9.11                 | 27.0                           | 6.70E-08          | 0.850                | 5.70E-08             | <u>{</u> ∗ └──                    | <u></u>                 | REMARK                 |                              |                      |
| 07/22/12               | 10         | 40               | 600             | 0.94        | 68.        |          | 9.50                 | 27.0                           | 6.60E-08          | 0.850                | 5.61E-08             | *                                 |                         | NEWARP                 | ····                         | 1                    |
| 07/22/12               | 10         | 50               | 600             | 0.97        | 68.        |          | 9.40                 | 27.0                           | 6.49E-08          | 0.850                | 5.52E-08             | 1*                                |                         |                        |                              |                      |
| 07/22/12               | 11         | 0                | 600             | 0.96        | 67.        |          | 9.30                 | 27.0                           | 6.56E-08          | 0.850                | 5.58E-08             | <b>1</b> *                        |                         |                        |                              |                      |
|                        |            | <u> </u>         |                 |             | <u></u>    | _        | ╎                    | lydraulic Con                  | <u></u>           | 4                    |                      | cm/sec                            |                         |                        |                              |                      |
| Flow pump              | ID #       | 2                | 44              | ] в         | Balance ID | -        | 1/6/7                |                                |                   | Pressure T           | ransducer ID :       | J .                               | 263                     | ]                      |                              |                      |
| Thermomet              |            | h                | 77              | 1           | Oven ID #  |          | 14/15                |                                | Board Press       |                      |                      | •                                 | 216                     | ] -                    | •                            |                      |
| Syringe ID a           | ¥          |                  | 46 .            | ]           |            |          |                      | ,<br>,<br>,                    | Pore Pressu       | ire Transd           | ucer ID #            |                                   | 28                      | ]                      |                              |                      |
|                        |            |                  |                 |             |            |          |                      |                                |                   |                      |                      |                                   |                         |                        |                              |                      |
|                        |            | ×                |                 |             |            |          |                      |                                |                   |                      |                      |                                   |                         |                        | ÷ .                          |                      |
|                        |            |                  |                 |             |            |          |                      |                                |                   |                      |                      |                                   |                         |                        |                              |                      |
|                        |            |                  |                 |             |            | ·        |                      |                                |                   |                      |                      | · .                               |                         | -                      |                              |                      |

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|--------------|------------|--------------|-----------------|-----------|-----------------|-------------|-------------|-----------------------|------------------|----------------|--------------|---------------|-----------------|--------------|-----------------|--------------------------|------------------------|
|              | . •        |              |                 |           |                 |             |             |                       |                  |                |              |               |                 |              |                 |                          |                        |
|              |            |              |                 |           |                 |             |             |                       |                  |                |              |               |                 |              |                 |                          |                        |
| [            |            | <del>ک</del> | 1               | Тімі      |                 | • <u></u>   | 1874 Forg   | ge Street Tuo         | ker, GA 3008     | 84             |              |               |                 |              |                 |                          |                        |
|              | TÊ.        | Íst          |                 | Engi      | NÈEI            | BING        | Phone: 77   | 70-938-8233           |                  |                |              |               |                 | N            |                 | Tested By                | EB                     |
| · ·          |            |              | 6               | Soil      |                 |             | Fax: 770-   | 923-8973              |                  |                |              |               |                 |              |                 | Date                     | 07/04/12               |
|              |            |              |                 | TEST      | S, LL           | C           | Web: www    | w.test-ilc.com        | 2021-2           | j=)¥°          | •            |               |                 |              |                 | Checked By               | 18                     |
| Client Pr. # |            | ·            |                 | <u> </u>  |                 | 2088/6.0    |             |                       |                  | <u> </u>       | Lab. PR, #   |               |                 |              | 1230-02-1       |                          | · ·                    |
| Pr. Name     |            |              | For             | mer North | Plant M         | IGP Site -I | SS Treatat  | oility Study          | ·····            |                | S. Type      |               |                 |              | Mold            |                          | · •                    |
| Sample ID    |            |              |                 | 13794     | Compo           | site Area A | , B, C, D)- | 2-1                   |                  |                | Depth/Elev.  |               |                 |              |                 |                          |                        |
| Subsample    |            |              | ·               |           |                 | 5           |             |                       |                  |                | Add. Info    |               |                 | Cu           | ring Age: 7 D   | Days                     |                        |
|              |            |              |                 | ASTM I    | 5084;           | Standar     | d Test M    | lethod for N          | leasureme        | ent of Hy      | draulic Con  | ductivity o   | f Satu          | rated Poro   | us              |                          |                        |
|              |            |              |                 |           | Ma              | terials U   | sing a Fl   | exible Wall           | Permeame         | eter (Met      | hod D, Con   | stant Rate    | of Flo          | w)           |                 |                          |                        |
| Ir           | nitial Sar | nple Dat     | a (Befor        | e Test)   |                 |             |             | Test Data             | 3                |                |              |               | 1               | Final Data ( | (After Test     | )                        |                        |
| Height       |            | 2.718        | in              | 6.90      | cm              | Speed       |             | •                     | 12               | ]              |              |               |                 |              |                 |                          |                        |
| Diameter     |            | 3.003        | in .            | 7.63      | cm              | Board Nu    | mber        |                       | 8                | ]              | Average Hei  | ght of Sample | 9               | 2.716        | ]in             | 6.90 cm                  |                        |
| Area         |            | 7.08         | in²             | 45.69     | cm ² | Cell Numi   | ber         |                       | 4                | ]              | Average Dia  | meter of Sam  | ple             | 3.006        | lin             | 7.64 cm                  |                        |
| Volume       |            | 315.46       | cm ³ | 0.0111    | ft ³ | Flow Purr   | np Number   |                       | 2A               | ]              | Area         | 7.10          | in²             | 45.79        | cm ² |                          |                        |
| Mass         |            | 571.90       | g               | 1.26      | ь               | Flow Purr   | np Rate     |                       | 5.60E-05         | cm³/sec        | Volume       | 315.86        | cm ³ | 0.0112       | ft ³ | Dry Density              | 89.2 pcf               |
| Specific Gra | wity       | 2.575        | (Assumed        | <br>ب(لا  | •               | B - Value   |             |                       | 0.95             | ]              | Mass         | 588.10        | g               | ~ 1.30       | lb              | Vol. of Voids            | 140.52 cm ³ |
| Dry Density  |            | 89.2         | pcf             |           |                 | Cell Press  | sure        |                       | 105.0            | psi            |              |               |                 |              | -               | Vol. of Solids           | 175.35 cm ³ |
|              | ·          |              | •               |           |                 | Back Pres   | ssure       |                       | 90.0             | psi            |              |               |                 |              |                 | Void Ratio               | 0.80                   |
|              | Nois       | ture Coni    | tent            | _         |                 | Confining   | (Effective) | ) Pressure            | 15.0             | psi            |              | Mois          | ture Co         | ontent       | _               | Saturation               | 97.2 %                 |
| Mass of well | sample &   | tare         | 571.90          | g         |                 | Max Head    | d           |                       | 64.01            | cm .           | Mass of wet  | sample & tare | э.              | 715.20       | g               |                          |                        |
| Mass of dry  | sample &   | tare         | 450.90          | g         | )               | Min Head    | I           |                       | 63.31            | ]cm            | Mass of dry  | sample & tare | <b>9</b> -      | 578.80       | g               |                          |                        |
| Mass of tare | )          |              | 0.00            | g         |                 | Maximum     | Gradient    |                       | 9.28             | ]              | Mass of tare |               |                 | 127.90       | g               | •                        |                        |
| % Moisture   |            |              | 26.8            |           |                 | Minimum     | Gradient    |                       | 9.18             | ]              | % Moisture   |               |                 | 30.3         |                 |                          |                        |
| TIME         | FUNCT      | ION          | Δt              | READING   | 3               | Head        | Gradient    | Temp.                 | PERME            | ABILITY        | (cm/sec)     |               | Note: D         | Deaired Wate | r Used for Pe   | ermeability Test.        |                        |
| DATE         | HOUR       | MIN          | (sec)           | (psi)     |                 | (cm)        |             | T _x ( °C ) | @ T _x | R _T | @ 20 °C      |               |                 | DESCRIPT     |                 |                          |                        |
| 07/04/12     | 6          | . 0          | -               | 0.91      | <u> </u>        | 34.01       | 9.28        | 27.0                  | -                | <u> </u>       |              |               | NA              |              | •               |                          | USCS                   |
| 07/04/12     | 6          | 10           | 600             | 0.90      |                 | 63.31       | 9.18        | 27.0                  | 1.33E-07         | 0.850          | 1.13E-07     |               |                 |              |                 | (ASTN                    | D2487;2488)            |
| 07/04/12     | 6          | 20           | 600             | 0.91      | (               | 34.01       | 9.28        | 27.0                  | 1.33E-07         | 0.850          | 1.13E-07     |               |                 | <u> </u>     |                 | _ L                      | NA                     |
| 07/04/12     | 6          | 30           | 600             | 0.90      | (               | 33.31       | 9.18        | 27.0                  | 1.33E-07         | 0.850          | 1.13E-07     | *             |                 |              | REMAR           | <s< td=""><td></td></s<> |                        |
| 07/04/12     | 6          | 40           | 600             | 0.90      |                 | 63,31       | 9.18        | 27.0                  | 1.33E-07         | 0.850          | 1.13E-07     | *             |                 |              |                 |                          |                        |
| 07/04/12     | 6          | 50           | 600             | 0.91      |                 | 34.01       | 9.28        | 27.0                  | 1.33E-07         | 0.850          | 1.13E-07     | *             |                 |              | ·               |                          |                        |
| 07/04/12     | 7          | 0            | 600             | 0.91      |                 | 34.01       | 9.28        | 27.0                  | 1.32E-07         | 0.850          | 1.12E-07     | *             |                 |              |                 |                          |                        |
|              |            |              |                 |           |                 | Reported    | Average H   | lydraulic Con         | ductivity*       |                | 1.1E-07      | cm/sec        | -               |              |                 |                          |                        |
| Flow pump    | D #        | 2.           | 44              |           | Balanc          | e ID #      | 1/6/7       | -                     | Differential R   | Pressure T     | ransducer ID | #             |                 | 262          |                 |                          |                        |
| Thermomete   | er ID #    | 3            | 77              |           | Oven II         | D#          | 14/15       | · ·                   | Board Press      | ure Trans      | ducer ID #   |               |                 | 215          |                 |                          |                        |
| Syringe ID # | ¢          |              | 45              |           |                 |             | <u> </u>    | •                     | Pore Pressu      | ire Transd     | ucer ID #    |               |                 | 28           | ]               |                          |                        |
| · ·          |            |              |                 |           |                 |             |             |                       |                  |                |              |               |                 | ······       | -               |                          |                        |

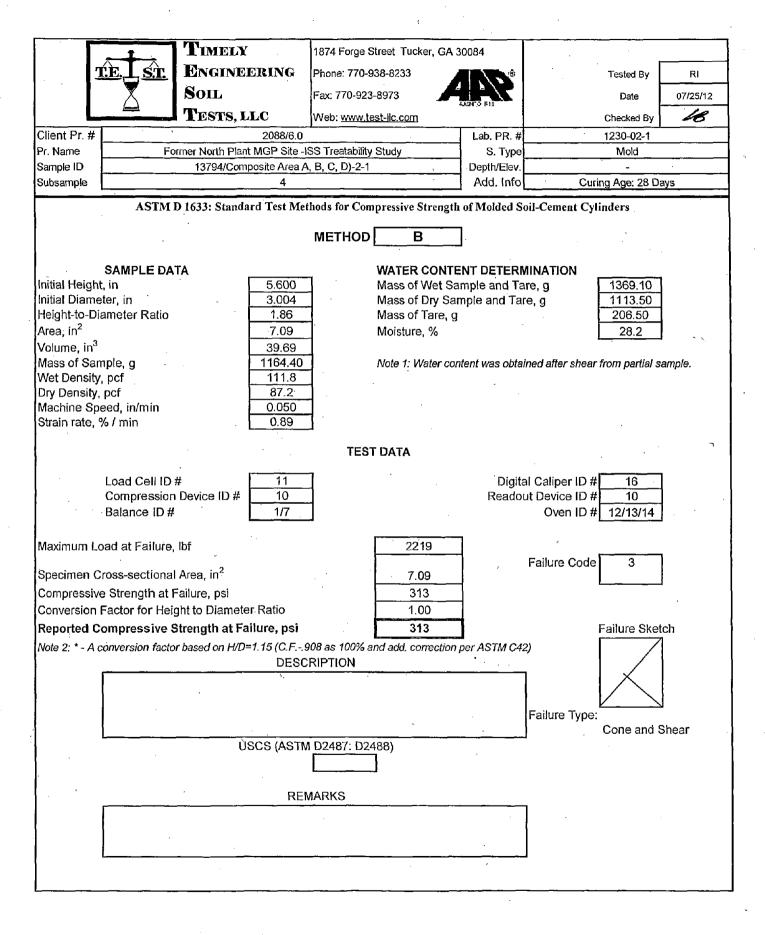
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|                                                                                     |                                              | t .                                         |                                        | TIMEL                                                        | <u>X</u>                                                                            | 1874 For                                                                          | ge Street Tu                                         | cker, GA 3008                                                                            | 34                                                                             |                                                                                       |                                                                                                |
|-------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                                                                                     | TE,                                          | <u>Lsr</u>                                  |                                        | ENGIN                                                        | EERING                                                                              | Phone: 7                                                                          | 70-938-8233                                          | A                                                                                        |                                                                                |                                                                                       | Tested By EB                                                                                   |
|                                                                                     |                                              |                                             |                                        | Son                                                          |                                                                                     | Fax: 770-                                                                         | 923-8973                                             | A                                                                                        |                                                                                | ļ                                                                                     | Date 07/11/12                                                                                  |
|                                                                                     |                                              | $\square$                                   |                                        | Tests,                                                       | LLC                                                                                 | Web: www                                                                          | w.test-llc.com                                       | JASH C                                                                                   | -1*                                                                            |                                                                                       | Checked By                                                                                     |
| Client Pr. #                                                                        |                                              |                                             |                                        |                                                              | 2088/6.0                                                                            | 1                                                                                 |                                                      | ······                                                                                   |                                                                                | Lab. PR. #                                                                            |                                                                                                |
| Pr. Name                                                                            |                                              |                                             | Foi                                    | mer North P                                                  | lant MGP Site -I                                                                    | SS Treatal                                                                        | bility Study                                         |                                                                                          |                                                                                | S. Type                                                                               | e Mold                                                                                         |
| Sample 1D                                                                           |                                              |                                             |                                        | 13794/C                                                      | omposite Area A                                                                     | A, B, C, D)-                                                                      | 2-1                                                  |                                                                                          |                                                                                | Depth/Elev.                                                                           |                                                                                                |
| Subsample                                                                           |                                              |                                             |                                        |                                                              | 6                                                                                   |                                                                                   |                                                      |                                                                                          |                                                                                | Add. Info                                                                             | Curing Age: 14 Days                                                                            |
|                                                                                     |                                              |                                             |                                        | ASTM D                                                       | 5084; Standa                                                                        | rd Test N                                                                         | lethod for l                                         | Measureme                                                                                | nt of Hy                                                                       | draulic Con                                                                           | nductivity of Saturated Porous                                                                 |
|                                                                                     |                                              |                                             |                                        |                                                              | Materials U                                                                         | sing a Fl                                                                         | exible Wall                                          | Permeame                                                                                 | eter (Met                                                                      | hod D, Cons                                                                           | nstant Rate of Flow)                                                                           |
| l Ir                                                                                | nitial Sar                                   | nple Dat                                    | a (Befor                               | e Test)                                                      |                                                                                     |                                                                                   | Test Dat                                             | a                                                                                        |                                                                                |                                                                                       | Final Data (After Test)                                                                        |
| Height                                                                              |                                              | 2.876                                       | lin                                    | 7.31 c                                                       | m . Speed                                                                           |                                                                                   |                                                      | · 12                                                                                     | ]                                                                              |                                                                                       |                                                                                                |
| Diameter                                                                            |                                              |                                             | in                                     | 7.60 c                                                       |                                                                                     | Imber                                                                             |                                                      | 7                                                                                        |                                                                                | Average Heig                                                                          | ight of Sample 2.880 in 7.32 cm                                                                |
| Area                                                                                |                                              |                                             | in ²                        |                                                              | m ² Cell Num                                                             | ber                                                                               |                                                      | 12                                                                                       |                                                                                |                                                                                       | imeter of Sample 2.985 in 7.58 cm                                                              |
| Volume                                                                              |                                              |                                             | cm³                                    | 0.0117 ft                                                    |                                                                                     | np Number                                                                         |                                                      | 2A                                                                                       |                                                                                | Area                                                                                  | 7.00 in ² 45.15 cm ²                                                     |
| Mass                                                                                |                                              | 601.70                                      | g                                      | 1.33lb                                                       |                                                                                     | •                                                                                 |                                                      |                                                                                          | cm³/sec                                                                        | Volume                                                                                | 330.27 cm ³ 0.0117 ft ³ Dry Density 90.4 pct                             |
| Specific Gra                                                                        | -                                            | 2.575                                       | (Assume                                | d)                                                           | B - Value                                                                           |                                                                                   |                                                      | 0.95                                                                                     |                                                                                | Mass                                                                                  | 615.60 g 1.36 lb Vol. of Voids 144.53 cm<br>Vol. of Solids 185.74 cm                           |
| Dry Density                                                                         |                                              | 89.9                                        | pcf                                    |                                                              | Cell Pres                                                                           |                                                                                   |                                                      | 105.0                                                                                    | psi                                                                            |                                                                                       | Vol. of Solids 185.74 cm<br>Void Ratio 0.78                                                    |
|                                                                                     | Mois                                         | ture Cont                                   | tent                                   |                                                              | Back Pre                                                                            | ssure<br>(Effective                                                               | Bronguro                                             | 90.0                                                                                     | psi<br>psi                                                                     |                                                                                       | Moisture Content Saturation 95.0 %                                                             |
| Mass of wet                                                                         |                                              |                                             | r                                      | ]g                                                           | Max Hea                                                                             |                                                                                   | ) Flessule                                           | 167,41                                                                                   | cm                                                                             | Mass of wet s                                                                         | sample & tare 674.30 ]g                                                                        |
| Mass of dry                                                                         |                                              |                                             | 477.20                                 | 9                                                            | Min Head                                                                            |                                                                                   |                                                      | 166.71                                                                                   | cm                                                                             | 1                                                                                     | sample & tare 537.30 g                                                                         |
| Mass of tare                                                                        | •                                            | 10.0                                        | 0.00                                   | g                                                            |                                                                                     | n Gradient                                                                        |                                                      | 22.89                                                                                    |                                                                                | Mass of tare                                                                          |                                                                                                |
| % Moisture                                                                          |                                              |                                             | 26.1                                   | ľ                                                            | Minlmum                                                                             | Gradient                                                                          |                                                      | 22.79                                                                                    | ŧ                                                                              | % Moisture                                                                            | 28.7                                                                                           |
| TIME                                                                                | FUNCT                                        |                                             | Δt                                     | READING                                                      | Head                                                                                | Gradient                                                                          | Temp.                                                | PERME                                                                                    | ABILITY                                                                        | (cm/sec)                                                                              | Note: Deaired Water Used for Permeability Test.                                                |
| DATE                                                                                | HOUR                                         | MIN                                         | (sec)                                  | (psi) ·                                                      | (cm)                                                                                |                                                                                   | T _x (°C)                                  | @ T _x                                                                         | RT                                                                             | @ 20 °C                                                                               |                                                                                                |
| 07/44/40                                                                            |                                              |                                             |                                        |                                                              |                                                                                     |                                                                                   |                                                      |                                                                                          |                                                                                |                                                                                       | DESCRIPTION                                                                                    |
| 07/11/12                                                                            | 7                                            |  30                              | -                                      | 2.38                                                         | 167.41                                                                              | 22.89                                                                             | 27.0                                                 |                                                                                          | -                                                                              | -                                                                                     |                                                                                                |
| 07/11/12                                                                            | 7<br>7                                       | 30<br>40                                    | -                                      | 2.38<br>2.37                                                 | 167.41<br>166.71                                                                    | 22.89<br>22.79                                                                    | 27.0<br>27.0                                         | -<br>5.43E-08                                                                            | -<br>0.850                                                                     | -<br>4.62E-08                                                                         |                                                                                                |
| ·                                                                                   |                                              |                                             |                                        |                                                              |                                                                                     |                                                                                   |                                                      | -<br>5.43E-08<br>5.43E-08                                                                | }                                                                              | 4.62E-08<br>4.62E-08                                                                  | NA                                                                                             |
| 07/11/12                                                                            | 7                                            | 40                                          | 600                                    | 2.37                                                         | 166.71                                                                              | 22.79                                                                             | 27.0                                                 |                                                                                          | 0.850                                                                          |                                                                                       | NA USCS<br>(ASTM D2487;2488)                                                                   |
| 07/11/12<br>07/11/12                                                                | 7                                            | 40<br>50                                    | 600<br>600                             | 2.37<br>2.38                                                 | 166.71<br>167.41                                                                    | 22.79<br>22.89                                                                    | 27.0<br>27.0                                         | 5.43E-08                                                                                 | 0.850<br>0.850                                                                 | 4.62E-08                                                                              | NA USCS<br>(ASTM D2467;2488)<br>NA                                                             |
| 07/11/12<br>07/11/12<br>07/11/12                                                    | 7<br>7<br>8                                  | 40<br>50<br>0                               | 600<br>600<br>600                      | 2.37<br>2.38<br>2.37                                         | 166.71<br>167.41<br>166.71                                                          | 22.79<br>22.89<br>22.79                                                           | 27.0<br>27.0<br>27.0                                 | 5.43E-08<br>5.43E-08                                                                     | 0.850<br>0.850<br>0.850                                                        | 4.62E-08<br>4.62E-08                                                                  | NA USCS<br>(ASTM D2467;2488)<br>NA                                                             |
| 07/11/12<br>07/11/12<br>07/11/12<br>07/11/12                                        | 7<br>7<br>8<br>8                             | 40<br>50<br>0<br>10                         | 600<br>600<br>600<br>600               | 2.37<br>2.38<br>2.37<br>2.38                                 | 166.71<br>167.41<br>166.71<br>167.41                                                | 22.79<br>22.89<br>22.79<br>22.89                                                  | 27.0<br>27.0<br>27.0<br>27.0                         | 5.43E-08<br>5.43E-08<br>5.43E-08                                                         | 0.850<br>0.850<br>0.850<br>0.850                                               | 4.62E-08<br>4.62E-08<br>4.62E-08                                                      | NA USCS<br>(ASTM D2467;2488)<br>NA                                                             |
| 07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>07/11/12                            | 7<br>7<br>8<br>8<br>8                        | 40<br>50<br>0<br>10<br>20                   | 600<br>600<br>600<br>600<br>600        | 2.37<br>2.38<br>2.37<br>2.38<br>2.37                         | 166.71<br>167.41<br>166.71<br>167.41<br>166.71<br>166.71<br>167.41                  | 22.79<br>22.89<br>22.79<br>22.89<br>22.79<br>22.79<br>22.89                       | 27.0<br>27.0<br>27.0<br>27.0<br>27.0                 | 5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08                                 | 0.850<br>0.850<br>0.850<br>0.850<br>0.850                                      | 4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08                              | NA USCS<br>(ASTM D2467;2488)<br>NA                                                             |
| 07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>07/11/12                            | 7<br>7<br>8<br>8<br>8<br>8                   | 40<br>50<br>0<br>10<br>20<br>30             | 600<br>600<br>600<br>600<br>600        | 2.37<br>2.38<br>2.37<br>2.38<br>2.37<br>2.38<br>2.37<br>2.38 | 166.71<br>167.41<br>166.71<br>167.41<br>166.71<br>166.71<br>167.41                  | 22.79<br>22.89<br>22.79<br>22.89<br>22.79<br>22.79<br>22.89                       | 27.0<br>27.0<br>27.0<br>27.0<br>27.0<br>27.0<br>27.0 | 5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>ductivity*                   | 0.850<br>0.850<br>0.850<br>0.850<br>0.850<br>0.850                             | 4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08                              | NA         USCS           (ASTM D2487;2488)         NA           *         REMARKS           * |
| 07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>07/11/12                | 7<br>7<br>8<br>8<br>8<br>8<br>0 #            | 40<br>50<br>0<br>10<br>20<br>30<br>24       | 600<br>600<br>600<br>600<br>600<br>600 | 2.37<br>2.38<br>2.37<br>2.38<br>2.37<br>2.38<br>2.37<br>2.38 | 166.71<br>167.41<br>166.71<br>167.41<br>166.71<br>167.41<br>167.41<br>Reported      | 22.79<br>22.89<br>22.79<br>22.89<br>22.79<br>22.89<br>22.89<br>Average H          | 27.0<br>27.0<br>27.0<br>27.0<br>27.0<br>27.0<br>27.0 | 5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>ductivity*                   | 0.850<br>0.850<br>0.850<br>0.850<br>0.850<br>0.850                             | 4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08<br>4.6E-08<br>ransducer ID # | NA         USCS           (ASTM D2487;2488)         NA           *         REMARKS           * |
| 07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>07/11/12<br>Flow pump I | 7<br>7<br>8<br>8<br>8<br>8<br>0 #<br>er ID # | 40<br>50<br>0<br>10<br>20<br>30<br>24<br>31 | 600<br>600<br>600<br>600<br>600<br>600 | 2.37<br>2.38<br>2.37<br>2.38<br>2.37<br>2.38<br>2.37<br>2.38 | 166.71<br>167.41<br>166.71<br>167.41<br>166.71<br>167.41<br>Reported<br>alance ID # | 22.79<br>22.89<br>22.79<br>22.89<br>22.79<br>22.89<br>22.89<br>Average H<br>1/6/7 | 27.0<br>27.0<br>27.0<br>27.0<br>27.0<br>27.0         | 5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>5.43E-08<br>ductivity*<br>Differential P | 0.850<br>0.850<br>0.850<br>0.850<br>0.850<br>0.850<br>Pressure T<br>ure Transe | 4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08<br>4.62E-08<br>4.6E-08<br>ransducer ID # | NA     USCS       (ASTM D2487;2438)     NA       *     REMARKS       *                         |

|                                       |               |                 |                 | TIME     | N                | 1874 For           | re Street. Tur                 | <br>ker, GA 3008 | 34                   |                            |                                       |                 |                |                 |                      | <u> </u>               |
|---------------------------------------|---------------|-----------------|-----------------|----------|------------------|--------------------|--------------------------------|------------------|----------------------|----------------------------|---------------------------------------|-----------------|----------------|-----------------|----------------------|------------------------|
|                                       | T.E.          | Î ST.           |                 |          | TEERING          | -                  | 70-938-8233                    | <i></i>          |                      |                            |                                       |                 |                | ,               | Tested By            | ЕВ                     |
|                                       | <b></b>       |                 |                 | Soil     |                  |                    |                                |                  |                      |                            |                                       |                 |                |                 | -                    |                        |
|                                       |               | Å i             |                 | •        |                  | Fax: 770-          | 923-8973                       | 005173           | - (¥                 |                            |                                       |                 |                |                 | Date                 | 07/25/12               |
|                                       |               | <u> </u>        |                 | TESTS    | , LLC            | Web: www           | w.test-llc.com                 |                  |                      |                            |                                       |                 |                |                 | Checked By           | 48                     |
| Client Pr. #                          |               |                 |                 |          | 2088/6:0         |                    |                                |                  | -                    | Lab. PR. #                 | · · · · · · · · · · · · · · · · · · · |                 |                | 1230-02-1       |                      |                        |
| Pr. Name<br>Sample (D                 |               |                 | For             |          | lant MGP Site -I |                    |                                |                  |                      | S. Type<br>Depth/Elev.     | ļ                                     |                 |                | Mold            |                      |                        |
| Subsample                             |               |                 |                 | 13794/0  | 7                | <u>, ь, с, р)-</u> | <u> </u>                       |                  |                      | Add. Info                  | ·                                     | <u> </u>        | Cur            | ing Age: 28 E   | )avs                 | <u> </u>               |
|                                       |               |                 | -               | ACTM     | 5084; Standar    | ed Toot M          | othed for I                    | Magaurama        | nt of Llv            |                            |                                       | of Sat          |                |                 |                      |                        |
|                                       |               |                 |                 | ASTIVID  | Materials U      |                    |                                |                  | •                    |                            | •                                     |                 |                | us              |                      |                        |
|                                       | itial Sar     | nnlo Dof        | a (Befor        |          | indicitate O     | Sing a Ph          | Test Dat                       |                  |                      |                            | Stant Nat                             |                 | Final Data (   | (Aftor Test)    | · ··· ·-· · ·        |                        |
|                                       | iniar Sai     |                 | а (ветон<br>].  | ·        |                  |                    | Test Data                      |                  | 1                    |                            |                                       |                 | i-iiiai Dala ( | (Allel lest)    |                      |                        |
| Height<br>Diameter                    |               | 2.759-<br>3.000 | in              |          | m Speed          | mbor               |                                | <u>13</u><br>6   |                      | Average Heig               | abt of Samp                           | lo              | 2.750          | lin             | 6.99 cm              |                        |
| Area                                  | -             |                 | in ² |          |                  |                    |                                | 2                | 1                    | Average Diar               |                                       |                 | 2.985          | lín             | 7.58 cm              |                        |
| Volume                                |               |                 | cm ³ | 0.0113 f | 2                | np Number          |                                | 2A               |                      | Area                       |                                       | lin²            | 45.15          | cm ² |                      |                        |
| Mass                                  |               | 572.20          | g .             | 1.26     |                  | •                  |                                | 2.80E-05         | cm ³ /sec | Volume                     | 315.36                                | cm ³ | 0.0111         | ft ³ | Dry Density          | 89.9 pcf               |
| Specific Gra                          | ivity         | 2.575           | (Assumed        | (t)      | B - Value        |                    |                                | 0.95             | ]                    | Mass                       | 587,30                                | g               | 1.29           | lb              | Vol, of Voids        | 138.86 cm ³ |
| Dry Density                           |               | 88.5            | pcf             |          | Cell Pres        | sure               |                                | 105.0            | psi                  | í .                        |                                       | _               |                | -               | Vol. of Solids       | 176.51 cm ³ |
|                                       |               |                 |                 |          | Back Pre         |                    |                                | 90.0             | psi                  |                            |                                       |                 |                |                 | Void Ratio           | 0.79                   |
| 1                                     |               | ture Coni       | r               | 1        |                  | (Effective)        | ) Pressure                     | 15.0             | psi                  |                            |                                       |                 | ontent         | 7               | Saturation           | 95.6 %                 |
| Mass of we                            |               |                 |                 | 9        | Max Hea          |                    |                                | 168.11           | lcm<br>1             | Mass of wet:               | •                                     |                 | 684.70         | g               | •                    |                        |
| Mass of dry                           | •             | tare            | 453.50          | 9        | Min Head         |                    |                                | 167.41           | lcm                  | Mass of dry s              | sample & tar                          | e               | 552.20         | g .             | · .                  |                        |
| Mass of tare                          |               |                 | 0.00            | 9        |                  | Gradient           | :                              | 24.07<br>23.97   | 4                    | Mass of tare<br>% Moisture | •                                     |                 | 98.70<br>29.2  | a               |                      |                        |
| % Moisture                            |               |                 | 26.2            |          | Minimum          | 1                  |                                |                  |                      | (cm/sec)                   | 1                                     | hl-t            |                | - Lised fee De  | and a billing The st |                        |
| · · · · · · · · · · · · · · · · · · · | FUNCT         |                 | Δt              | READING  | Head             | Gradient           | Temp.<br>T _x ( ⁰C ) |                  | RT                   | (cm/sec)<br>@ 20 °C        | ł                                     | Note:           |                |                 | ermeability Test.    |                        |
| DATE                                  | HOUR          | MIN             | (sec)           | (psi)    | (cm)             | 04.07              |                                |                  |                      |                            |                                       | NA              | DESCRIPT       | !UN             | ٦.                   |                        |
| 07/25/12                              | 8             | 0<br>10         | ~               | 2.39     | 168.11           | 24.07              | 27.0<br>27.0                   | 2.58E-08         | 0.850                | 2.20E-08                   | ł .                                   |                 |                |                 |                      | JSCS<br>D2487;2488)    |
| 07/25/12                              | 8             | <u> </u>        | 600             | 2.38     | 167.41<br>167.41 | 23.97<br>23.97     | 27.0                           | 2.59E-08         | 0.850                | 2.20E-08                   | ł                                     |                 | · ·            |                 | 1                    | NA                     |
| 07/25/12                              | <u>8</u><br>8 | 20<br>30        | 600<br>600      | 2.38     | 168.11           | 23.97              | 27.0                           | 2.59E-08         | 0.850                | 2.20E-08                   | *                                     | L               |                | REMARK          |                      |                        |
| 07/25/12                              |               | 40              | · 600           | 2.39     | 167.41           | 24.07              | 27.0                           | 2.58E-08         | 0.850                | 2.20E-08                   | *                                     |                 |                |                 |                      |                        |
| 07/25/12                              | <u>8</u><br>8 | 50              | 600             | 2.30     | 168.11           | 23.97              | 27.0                           | 2.58E-08         | 0.850                | 2.20E-08                   | *                                     |                 |                |                 |                      |                        |
| 07/25/12                              | <u> </u>      | 0               | 600             | 2.39     | 168.11           | 24.07              | 27.0                           | 2.58E-08         | 0.850                | 2.19E-08                   | *                                     |                 |                |                 |                      |                        |
| 07/25/12                              | 3             | <u> </u>        | 000             | 2,39     |                  |                    |                                | 1                | 0.000                |                            |                                       | L               |                |                 |                      | <b>_</b>               |
|                                       | n             |                 |                 | 1.       |                  |                    | lydraulic Con<br>]             |                  |                      | J                          | cm/sec                                |                 | 000            | 7.              |                      | -                      |
| Flow pump                             |               | <u> </u>        | 44              | 1        | Balance ID #     | 1/6/7              |                                |                  |                      | Transducer ID              | #                                     |                 | 262            | 1               |                      | -                      |
| Thermomete                            |               |                 | 77              |          | Oven ID #        | 14/15              | l                              | Board Press      |                      |                            |                                       |                 | 216            | -               |                      |                        |
| Syringe ID #                          | F             | 2               | 45              | ľ        |                  |                    |                                | Pore Pressu      | ne manso             |                            |                                       | •               | 28             | J               |                      | •                      |

| Soil     Fax: 770-923-8973     Date     07/04       Client Pr. #     2088/6.0     Lab. PR. #     1230-02-1       Name     Former North Plant MGP Site -ISS Treatability Study     S. Type     Mold       ample ID     13794/Composite Area A, B, C, D)-2-1     Add. Info     Curing Age: 7 Days       Astrm D 1633: Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders     METHOD     B       SAMPLE DATA     WATER CONTENT DETERMINATION     Mass of Wet Sample and Tare, g     1357.70       nitial Diameter, in     3.001     Mass of Dry Sample and Tare, g     1357.70       Height-to-Diameter Ratio     1.84     Mass of Tare, g     208.00       Area, in ² 7.07     Moisture, %     29.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SOIL<br>Trests, LLC     Fex: 770-923-8973<br>Web: youw isst-lac.com     Late     Orrow/<br>Checked by       Iert Pr. #     2080/60     2080/60     5. Type     1000/60       Inter Pr. #     2080/60     5. Type     1000/60       Ibeample     13734/Composite Avea A, B, C, D-2-1     2. Type     1000/60       Ibeample     13734/Composite Avea A, B, C, D-2-1     2. Type     1000/60       Add. Info     Curing Age: 7 Days     0.000       Add. Info     Curing Age: 7 Days       Add. Info     0.001     0.001       Midd Height, in     5.509     0.001       Midd Height, in     0.001     0.001       Midd Diameter, in     0.001     0.001       Bass of Dample, g     1156.70     0.000       et Density, pcf     168.9     0.001       achine Speed, invinin     0.050     0.001       Digital Caliper ID #     10     0.001       Balance ID #     11     0.001       onerseision Storgth at Failure, psi     0.002       onversion Factor Pressive Strength at Failure, psi     7.07       onsersion Factor Pressive Strength at Failure, psi     7.07       onsersion Factor Pressive Strength at Failure, psi     7.07       onsersion Factor Pressive Strength at Failure, psi     112       oneressive Strength at Failure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                         | <u>retsr</u>                          | Timely<br>Engineeri                   | _                 | e Street Tucker, G/<br>0-938-8233     | A 30084                                     | -                                      | Tested By        | RI      |
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| Image: Product of the standing structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of                               | Interference     Image of all interference     Checked By       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference     Image of all interference     Image of all interference       Interference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                                       |                                       |                   |                                       |                                             |                                        |                  | 07/04/1 |
| Allent Pr, #       2089/80       Lab. PR, #       1220-02-1         It, Name       Former North Plant MGP Site-ISS Treatability Sludy       Depth/Elepide       Add.         ubsample       13784/Composite Area A, B, C, D, D, 2-1       Add. Info       Curing Age: 7 Days         ASTM D 1633: Standard Test Methods for Compressive Strength of Molded Sull-Cement Cylinders       METHOD       B         SAMPLE DATA       S.000       Mass of VMS Sample and Tare, g       1357.70         Initial Diameter, in       5.009       Mass of VMS Sample and Tare, g       10056.00         Vea, in ² 7.07       Mass of VMS Sample and Tare, g       10056.00         Vea, in ³ 66.9       Molet Sample, g       1150.70         Vei Density, pcf       112.6       Molet Sample, g       10056.00         VP Density, pcf       112.6       Molet Sample, g       Vota 1: Water content was obtained after sheer from partial sample.         VP Density, pcf       112.6       Molet Sample, g       Vota 1: Water content was obtained after sheer from partial sample.         VP Density, pcf       112.6       Molet Sample, g       Failure Code       3         Specimen Cross-sectional Area, in ² 0.9       Tormer saino Table, pi       10       Oven 10 #       10         Specimen Cross-sectional Area, in ²                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ient Pr, #     2089/30     Lab. PR. #     1220-02-1       Name     Former Noth Plant MGP Site -ISS Treatability Sludy     S. Type     Mold       beample     13784/Composite Area A, B, C, D)-2-1     Addl. Info     Curing Age: 7 Days       ASTM D 1633: Standard Yest Methods for Compressive Strength of Molded Soil-Commer Cylinders     METHOD     B       SAMPLE DATA     METHOD     B       statilital Diameter, in     3.001     Mass of DVS Sample and Tare, g     1357.70       itial Height, in     5.509     Mass of VMS Sample and Tare, g     1096.00       path PL Data     1120-02     Mess of VMS Sample and Tare, g     1096.00       path PL Data     1150.70     Mess of VMS Sample and Tare, g     1096.00       path PL Data     1150.70     Mess of Tare, g     1096.00       statine Speed, infmin     0.050     Moisture, %     29.5       statine Speed, infmin     0.050     1150.70     Mess of Tare, g     1096.00       path PL Data     1150.70     112.5     Moisture, %     29.5       vide Density, pcf     112.5     0.60     29.6     29.6       path PL Data     112     Digital Caliper ID #     10       Compression Device ID #     11     0     10     10       gendend ID #     11     10     10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                       | $\Delta$                              |                                       |                   | _                                     | TYPE ALL ALL ALL ALL ALL ALL ALL ALL ALL AL | C                                      | -                |         |
| r. Neme Former North Plant MGP Ste -ISS Treatability Study Depth/Elex Add. Index Age 7. Days Model Soli-Cancent Cylinders Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age 7. Days Add. Index Age | Name       Former North Plant MGP Site JSS Treetebility Study       S. Type       Mold         membel D       13784/Composite Area A, B, C, D)-2-1       Depht/Eix/       Curing Age: 7 Days         ASTM D 1633: Standard Test Methods for Compressive Strength of Molded Soil-Compart Cylinders         METHOD B         SAMPLE DATA         WATER CONTENT DETERMINATION         Mass of Vert Sample and Tare, g         Mile JB Interfer Ratio         ea, in ² 707         sas of Sample, g       1150.70         Mote to Mass of Tare, g         Mass of D's Sample and Tare, g         Moss of Tare, g         Mass of D's Content Vas obtained after shear from partial sample.         to Moisture, %         Detaily, port         action of Methods for Compressive Strength at Failure, psi         TEST DATA         Load Cell ID #         Compression Device ID #         To 2         Methods for Compressive Strength at Failure, psi         Device ID #         Compressive Strength at Failure, psi         Onversive Strength at Failure, psi <td< td=""><td>Client Pr. #</td><td><u></u></td><td></td><td></td><td></td><td>Lab. PR. #</td><td>••••••••••••••••••••••••••••••••••••••</td><td></td><td>-0</td></td<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Client Pr. #            | <u></u>                               |                                       |                   |                                       | Lab. PR. #                                  | •••••••••••••••••••••••••••••••••••••• |                  | -0      |
| ubeample       2       Add. Info       Curing Age: 7 Days         ASTM D 1633: Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders         METHOD       B         SAMPLE DATA       WATER CONTENT DETERMINATION         Initial Diameter, in teight-to-Diameter Ratio       1.84         Vero, in ² 7.07         Mass of Sample and Tare, g       1357.70         Mass of Sample and Tare, g       1096.00         Vero Jensity, pcf       1.84         Mass of Sample and Tare, g       1006.00         Mass of Sample and Tare, g       1008.00         Mass of Sample and Tare, g       1008.00         Mass of Sample and Tare, g       1008.00         Mass of Sample and Tare, g       112.5         Mass of Sample and Tare, g       112.5         Mass of Sample and Tare, g       112.5         Mass of Data       112.5         Mass of Data       112.5         Mass of Data       112.5         Compressino                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | beample       2       Add. Info       Curing Age: 7 Days         ASTM D 1633: Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders         METHOD         SAMPLE DATA         WATER CONTENT DETERMINATION         Mass of Dry Sample and Tare, g         1357.70         Mass of Dry Sample and Tare, g         1357.70         Mass of Tare, g         1357.70         Mass of Tare, g         Mass of Tare, g         1357.70         Mass of Tare, g         Mass of Tare,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Pr. Name                | For                                   |                                       |                   |                                       | S. Type                                     |                                        | Mold             |         |
| ASTM D 1633: Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders           METHOD         B           SAMPLE DATA         MATER CONTENT DETERMINATION           nitial Height, in         5509           nitial Diameter, in         3001           184         707           Ass of Sample, g         1357.70           Volume, in ³ 184           Ass of Sample, g         1150.70           Vei Density, pof         112.5           Ass of Sample, g         1150.70           Vei Density, pof         68.9           Achtine Speed, in/min         0.050           0.91         1177           Note 1: Water content was obtained after sheer from partiel sample.           Vei Density, pof         112.5           Aschine Speed, in/min         0.050           0.931         TEST DATA           Load Cell ID #         11           Compression Device ID #         10           177         Pailure Code         3           Specimen Cross-sectional Area, in ² 7.07         Failure Code         3           Specimen Cross-sectional Area, in ² 7.07         Failure Code         3           Specimen Cross-sectional Area, in ² 112         Failure Type:         <                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ASTM D 1633: Standard Test Methods for Compressive Strength of Molded Soil-Cement Cylinders           METHOD         B           SAMPLE DATA         WATER CONTENT DETERMINATION           tital Height, in         509           tital Height, in         509           tital Height, in         509           tital Height, in         509           tital Diameter, in         3001           1.84         Mass of Vet Sample and Tare, g           pight-to-Diameter Ratio         1187,70           est, in ² 7.07           ass of Sample, g         112,57           obume, in ³ 38.97           ass of Sample, g         112,57           wess of Tare, g         29,5           Note 1: Weier content was obtained after shear from partial sample.           tel Density, pcf         0.91           y Density, pcf         112           Salance ID #         11           Compression Device ID #         11           Compressive Strength at Failure, psi         0.91           onversion Factor for Height to Diameter Ratio         1.00           peoted Compressive Strength at Failure, psi         1.10           onversion Factor for Height to Diameter Ratio         1.10           peoted Compressive Strength at Failure, psi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Sample ID               |                                       | 13794/Composite                       |                   | -1                                    |                                             |                                        | -                |         |
| METHOD       B         SAMPLE DATA       5.009         nitial Height, in<br>mitial Diameter, in<br>leight-Dometer Ratio<br>tree, in ² 5.009         Auss of Sample, g       30.01         Vib Density, pcf       182.7         Auss of Sample, g       0.050         Vib Density, pcf       86.9         Auss of Sample, g       0.050         Vib Density, pcf       86.9         Auss of Sample, g       0.050         Optime, final       0.050         Balance ID #       11         Compression Device ID #       11         Compressive Strength at Failure, psi       Digital Caliper ID #         Septement Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       7.07         Sported Compressive Strength at Failure, psi       7.07         Moise 2 * - A conversion factor based on H/D=1.15 (CF. 678 as 100%) and edd. correction per ASTM C42)       Failure Steech         Moise 2 * - A conversion factor based on H/D=1.15 (CF. 678 as 100%) and edd. correction per ASTM C42       Failure Type:         Cone and Shear       0.050       0.050         Description       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | METHOD       B         SAMPLE DATA       5.509         tital Height, in<br>tital Diameter, in<br>tital Diameter, Ratio<br>regint-to-Diameter Ratio<br>regints, pof       5.509       Mass of Dwy Sample and Tare, g       1357.70         ass of Sample, g       1.84       Moisture, %       0.000       0.000         ass of Sample, g       112.5       Moisture, %       0.000       0.000         y Density, pof       112.5       0.050       0.050       0.051         y Density, pof       0.050       0.91       Note 1: Water content was obtained after sheer from partial semple.         Mass of Call ID #       11       0.050       0.91         Compression Device ID #       11       Digital Caliper ID #       16         Compression Device ID #       11       11       Digital Caliper ID #       16         Compression Device ID #       11       11       Digital Caliper ID #       16         conversion Factor for Height to Diameter Ratio<br>porterion For Height to Diameter Ratio<br>porterion for Height to Diameter Ratio       112       Failure Stetch         Description       ESCRIPTION       Failure Type:       Cone and Shear         West Sample       Noter Stetch Diameter Ratio       Stetch Diameter Ratio       Stetch Diameter Ratio         Discription       12 <td< td=""><td>Subsample</td><td></td><td>· · · · · · · · · · · · · · · · · · ·</td><td></td><td></td><td></td><td></td><td></td><td>ys</td></td<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Subsample               |                                       | · · · · · · · · · · · · · · · · · · · |                   |                                       |                                             |                                        |                  | ys      |
| SAMPLE DATA         WATER CONTENT DETERMINATION         mital Height, in       5.509         nitial Diameter, in       3.001         teight-to-Diameter Ratio       1.84         Mass of Wet Sample and Tare, g       1096.00         Mass of Sample, g       0.050         Vel Density, pcf       112.5         Moisture, %       0.050         Dy Density, pcf       0.050         Mass of Vel Sample and Tare, g       1096.00         Mass of Sample, g       0.050         Vel Density, pcf       0.050         Machine Speed, in/min       0.050         Oy Density, pcf       0.91         Machine Speed, in/min       0.050         Balance 1D #       11         Compression Device 1D #       11         Tompressive Strength at Failure, psi       7.07         Compressive Strength at Failure, psi       112         Compressive Strength at Failure, psi       112         Description       125 (.5F.908 as 100% and add. correction per ASTM C42)         Description       Failure Type:         Cono and Shear       Cono and Shear         USCS (ASTM D2487: D2486)       EMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SAMPLE DATA         WATER CONTENT DETERMINATION         Mass of Vet Sample and Tare, g         itial Diameter, in       3.001         itial Diameter, in       1.84         bume, in ³ 30.01         as of Sample, g       1150.70         bume, in ³ 38.97         as of Sample, g       1150.70         v Density, pcf       112.5         y Density, pcf       68.9         y Density, pcf       0.050         0.01       0.050         0.021       0.050         0.031       0.01         TEST DATA         Load Cell ID #         Compression Device ID #       11         Compression Device ID #       11         Compression Device ID #       11         Oven ID #       112         Balance ID #       11         Onversion Factor for Height to Diameter Ratio       112         period Compressive Strength at Failure, psi       7.07         onversion Factor for Height to Diameter Ratio       112         period Compressive Strength at Failure, psi       112         Ote 2: * - A conversion factor based on H/D=1.15 (CF908 as 100% and add correction per ASTM C42)       Failure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         | ASTM I                                | ) 1633: Standard T                    | est Methods for C | ompressive Streng                     | th of Molded S                              | oil-Cement Cyline                      | ders             |         |
| nitial Height, in       5.509         nitial Diameter, in       5.509         nitial Diameter, in       3.001         dight-to-Diameter Ratio       7.07         Ass of Sample, g       1150.70         Mass of Sample, g       1150.70         Wet Density, pcf       38.97         Ass of Sample, g       1150.70         Wet Density, pcf       86.9         Achine Speed, inmin       0.050         0.91       112.5         By Density, pcf       86.9         Achine Speed, inmin       0.050         0.91       112         Balance ID #       11         Compression Device ID #       11         Compression Device ID #       11         Compressive Strength at Failure, psi       7.07         Compressive Strength at Failure, psi       7.07         Compressive Strength at Failure, psi       112         Conversion factor based on H/D=1.15 (C.F060 as 100% and add. correction per ASTM C42)       Failure Sketch         Wate 2.* - A conversion factor based on H/D=1.15 (C.F060 as 100% and add. correction per ASTM C42)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Failure Type:         Cone and Shear       NeEMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | tital Height, in       5509         itial Diameter, in       3001         gight-to-Diameter Ratio       1.84         ybume, in ³ 38.97         ass of Sample, g       1150.70         feit Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       11.0         compression Device ID #       11         Compression Device ID #       11         Compression Device ID #       11         Operation Device ID #       11         Compressive Strength at Failure, psi       707         onversion Factor for Height to Diameter Ratio       112         percimen Cross-sectional Area, in ² 7.07         onversion factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                       | -<br>-                                | METHO             | D B                                   |                                             | ,                                      |                  |         |
| nitial Height, in       5.509         nitial Diameter, in       5.509         nitial Diameter, in       3.001         dight-to-Diameter Ratio       7.07         Ass of Sample, g       1150.70         Mass of Sample, g       1150.70         Wet Density, pcf       38.97         Ass of Sample, g       1150.70         Wet Density, pcf       86.9         Achine Speed, inmin       0.050         0.91       112.5         By Density, pcf       86.9         Achine Speed, inmin       0.050         0.91       112         Balance ID #       11         Compression Device ID #       11         Compression Device ID #       11         Compressive Strength at Failure, psi       7.07         Compressive Strength at Failure, psi       7.07         Compressive Strength at Failure, psi       112         Conversion factor based on H/D=1.15 (C.F060 as 100% and add. correction per ASTM C42)       Failure Sketch         Wate 2.* - A conversion factor based on H/D=1.15 (C.F060 as 100% and add. correction per ASTM C42)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Failure Type:         Cone and Shear       NeEMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | tital Height, in       5509         itial Diameter, in       3001         gight-to-Diameter Ratio       1.84         ybume, in ³ 38.97         ass of Sample, g       1150.70         feit Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       112.6         y Density, pcf       11.0         compression Device ID #       11         Compression Device ID #       11         Compression Device ID #       11         Operation Device ID #       11         Compressive Strength at Failure, psi       707         onversion Factor for Height to Diameter Ratio       112         percimen Cross-sectional Area, in ² 7.07         onversion factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | •                       |                                       | · ·                                   |                   |                                       |                                             |                                        |                  |         |
| Additional content of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s                               | tital Diameter, in       3.001         eight-to-Diameter Ratio       1.84         eight-to-Diameter Ratio       1.84         eight-to-Diameter Ratio       1.84         eight-to-Diameter Ratio       1.84         blume, in ³ 38.97         ass of Sample, g       1150.70         to Eb Density, pcf       112.5         ny Density, pcf       112.5         achine Speed, in/min       0.050         name rate, % / min       0.050         Digital Caliper ID #       10         Coad Cell ID #       11         Balance ID #       11         Ower ID #       12/13/14         aximum Load at Failure, Ibf       707         pecimen Cross-sectional Area, in ² 7.07         Intal 2       1.00         pecimen Cross-sectional Area, in ² 1.12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Initial Hoigh           |                                       |                                       | 500               |                                       |                                             |                                        | 1357 70          |         |
| teight-to-Diameter Ratio       1.84         twea, in ² 7.07         Aass of Sample, g       1150.70         Mass of Sample, g       1150.70         Mass of Sample, g       112.5         Vet Density, pcf       12.6         Model 1: Water content was obtained after shear from partial sample.         Vet Density, pcf       66.9         Aachine Speed, in/min       0.050         Strain rate, % / min       0.050         Strain rate, % / min       0.050         Strain rate, % / min       11         Load Cell ID #       11         Compression Device ID #       10         1/7       Note 1: Water content was obtained after shear from partial sample.         Value       112.5         Specimen Cross-sectional Area, in ² Digital Caliper ID #         Compressive Strength at Failure, psi       7.07         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       112         Specimen Cross-section factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:         Conce and Shear       USCS (ASTM D2487: D2488)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | eight-to-Diameter Ratio       184       Mass of Tare, g       208.00         ea, in ² 38.97       Moisture, %       29.5         ass of Sample, g       1150.70       Note 1: Water content was obtained after shear from partial sample.         Vet Density, pof       86.9       0.050         achine Speed, in/min       0.050       0.91         TEST DATA         Load Cell ID #         Compression Device ID #       11         Compression Device ID #       11         1/7       Digital Caliper ID #         Balance ID #       11         Compression Device ID #       11         1/7       Readout Device ID #         1/7       Pailure Code         3       3         aximum Load at Failure, psi       112         ported Compressive Strength at Failure, psi       112         ate 2: * - A conversion factor for Height to Diameter Ratio       110         percent Compressive Strength at Failure, psi       112         It at 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
| Wee, in ² 7.07         /olume, in ³ 38.97         Mass of Sample, g       1150.70         Wet Density, pcf       112.5         Jry Density, pcf       86.9         docknes, % / min       0.050         Balance ID #       11         Compression Device ID #       11         Compression Device ID #       11         Compression Device ID #       11         Compression Device ID #       11         Compression Device ID #       11         Maximum Load at Failure, lbf       7.07         Specimen Cross-sectional Area, in ² 7.07         Conversion Factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42)       Failure Sketch         Vole 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ea, in ²<br>blume, in ³<br>ass of Sample, g<br>tet Density, pcf<br>y Density, pcf<br>achine Speed, in/min<br>achine Speed, in/min<br>Compression Device ID #<br>Load Cell ID #<br>Compression Device ID #<br>112.5<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>TEST DATA<br>TEST                          |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
| Actume, in ³ 38.97         Aass of Sample, g       1150.70         Met Density, pcf       112.5         bry Density, pcf       86.9         Acthine Speed, in/min       0.050         Strain rate, % / min       0.91         TEST DATA         Load Cell ID #         10       10         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       112         Compressive Strength at Failure, psi       1.00         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       1.00         Strain factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         Web 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | blume, in ³<br>ass of Sample, g<br>(if Density, pof<br>y Density, pof<br>achine Speed, in/min<br>compression Device ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Compression Device ID #<br>11<br>Balance ID #<br>TEST DATA<br>Load Cell ID #<br>Compression Device ID #<br>11<br>Balance ID #<br>Test DATA<br>Load Cell ID #<br>Compressive Strength at Failure, psi<br>onversion Factor for Height to Diameter Ratio<br>eported Compressive Strength at Failure, psi<br>onversion factor based on H/D=1.15 (C.F008 as 100% and add. correction per ASTM C42)<br>DESCRIPTION<br>REMARKS<br>REMARKS<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Note 1: Water content was obtained after shear from partial sample.<br>Test DATA<br>Test DATA                                                                                                       | Area, in ²   |                                       |                                       |                   |                                       | 9                                           |                                        |                  |         |
| Wet Density, pcf       112.5         hy Density, pcf       86.9         Achine Speed, in/min       0.050         0.91       0.050         Strain rate, % / min       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       0.050         0.91       11         Compression Device ID #       10         1/7       Readout Device ID #         Aaximum Load at Failure, Ibf       790         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       112         Spected Compressive Strength at Failure, psi       112         Nofe 2: * - A conversion factor based on H/D=1.15 (G.F908 as 100% and add correction per ASTM C42)       Failure Type:         Description       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | fet Density, pcf     112.5       wy Density, pcf     0.050       achine Speed, in/min     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31     0.050       0.31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Volume, in ³ |                                       | 3                                     | 8.97              |                                       |                                             |                                        |                  |         |
| by Density, pcf       86.9         dachine Speed, in/min       0.050         Strain rate, % / min       0.91         TEST DATA         Load Cell ID #         11       10         Compression Device ID #         11       10         Digital Caliper ID #         12       0.050         Digital Caliper ID #         10       10         Digital Caliper ID #         11       10         Compression Device ID #         3pecimen Cross-sectional Area, in?       7.07         Compressive Strength at Failure, psi       112         Conversion Factor for Height to Diameter Ratio       7.07         Reported Compressive Strength at Failure, psi       112         Use 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ry Density, pcf<br>achine Speed, in/min<br>rain rate, % / min<br>TEST DATA<br>Load Cell ID #<br>Compression Device ID #<br>11<br>Balance ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>Load Cell ID #<br>11<br>Compression Device ID #<br>10<br>17<br>Balance ID #<br>17<br>Digital Caliper ID #<br>16<br>10<br>Oven ID #<br>12/13/14<br>Pailure Code<br>3<br>Failure Code<br>3<br>Failure Sketch<br>Failure Sketch<br>DESCRIPTION<br>Failure Type:<br>Cone and Shear<br>USCS (ASTM D2487: D2488)<br>REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                         |                                       |                                       |                   | Note 1: Water c                       | content was obta                            | ined after shear fro                   | om partial sa    | ample.  |
| Machine Speed, in/min       0.050         Strain rate, % / min       0.050         Output       0.91         TEST DATA         Load Cell ID #       11         Compression Device ID #       10         10       1/7         Balance ID #       1/7         Advinum Load at Failure, Ibf       790         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       112         Donversion Factor for Height to Diameter Ratio       1.00         Reported Compressive Strength at Failure, psi       Failure Sketch         Joie 2: * - A conversion factor based on H/D=1.15 (CF908 as 100% and add. correction per ASTM C42)       Failure Type:         USCS (ASTM D2487: D2488)       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | achine Speed, in/min       0.050         rrain rate, % / min       0.050         0.91       TEST DATA         TEST DATA         Load Cell ID #         11       10         Digital Caliper ID #         10       10         Balance ID #         177       Readout Device ID #         177       Oven ID #         177       Oven ID #         177       Pailure Code         3       112         pecimen Cross-sectional Area, in ² 7.07         onversion Factor for Height to Diameter Ratio       112         eported Compressive Strength at Failure, psi       112         onversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                       |                                       |                   |                                       | •                                           |                                        |                  |         |
| Strain rate, % / min       0.91         TEST DATA         Load Cell ID #         10       11         10       10         Balance ID #       11/7         Maximum Load at Failure, Ibf       790         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       112         Compressive Strength at Failure, psi       112         Specimen Cross-sectional Area, in ² 7.07         Compressive Strength at Failure, psi       112         Strein rate, % / min       Failure Code         3       90         Specimen Cross-sectional Area, in ² Failure Code         3       112         Compressive Strength at Failure, psi       100         Maximum Load at Conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         Wolf 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:         Cone and Shear       USCS (ASTM D2487: D2488)       Cone and Shear         USCS (ASTM D2487: D2488)       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Train rate, % / min  O.91  TEST DATA  Load Cell ID # Compression Device ID # 10 10 17  Digital Caliper ID # 10 10 10 11 10 Coven ID # 10 0ven ID # 10 11 0 Ven ID # 12/13/14  aximum Load at Failure, lbf pecimen Cross-sectional Area, in ² onversion Factor for Height to Diameter Ratio eported Compressive Strength at Failure, psi ate 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add, correction per ASTM C42) DESCRIPTION  Failure Type: Cone and Shear  REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         |                                       |                                       |                   |                                       |                                             |                                        | · ·              |         |
| TEST DATA         Load Cell ID #       11       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       10       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11       11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TEST DATA         Load Cell ID #       11       Digital Caliper ID #       16         Compression Device ID #       10       10       Readout Device ID #       10         Balance ID #       117       Pailure Device ID #       10       10       Oven ID #       12/13/14         aximum Load at Failure, lbf       790       Failure Code       3         pecimen Cross-sectional Area, in ² 7.07       Failure Code       3         ompressive Strength at Failure, psi       112       Failure Code       3         onversion Factor for Height to Diameter Ratio       112       Failure Sketch       Failure Sketch         DesCRIPTION       DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
| Load Cell ID #       11       Digital Caliper ID #       16         Compression Device ID #       10       17       Device ID #       10         Maximum Load at Failure, Ibf       790       Failure Code       3         Specimen Cross-sectional Area, in ² 7.07       Failure Code       3         Compressive Strength at Failure, psi       112       Failure Code       3         Conversion Factor for Height to Diameter Ratio       1.00       112       Failure Sketch         Note 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42)       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear         REMARKS       REMARKS       Steepeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Load Cell ID #       11       Digital Caliper ID #       16         Balance ID #       1/7       Readout Device ID #       10         aximum Load at Failure, Ibf       790       Failure Code       3         pecimen Cross-sectional Area, in ² 7.07       Failure Code       3         ompressive Strength at Failure, psi       1.00       112       Failure Sketch         ation onversion Factor for Height to Diameter Ratio       1.00       112       Failure Sketch         ate 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ,                       |                                       | <b>k</b>                              |                   | r'                                    |                                             |                                        |                  |         |
| Compression Device ID #       10       17       Readout Device ID #       10         Balance ID #       1/7       Oven ID #       12/13/14         Maximum Load at Failure, Ibf       790       Failure Code       3         Specimen Cross-sectional Area, in ² 7.07       Failure Code       3         Compressive Strength at Failure, psi       112       Failure Code       3         Conversion Factor for Height to Diameter Ratio       1.00       Failure Sketch         Reported Compressive Strength at Failure, psi       112       Failure Sketch         word 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear         REMARKS       REMARKS       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Compression Device ID #       10       10       Readout Device ID #       10         Balance ID #       1/7       Oven ID #       12/13/14         aximum Load at Failure, Ibf       790       Failure Code       3         pecimen Cross-sectional Area, in ² 7.07       Failure Code       3         ompressive Strength at Failure, psi       112       Failure Code       3         onversion Factor for Height to Diameter Ratio       1.00       Failure Sketch       Failure Sketch         oble 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                       |                                       | TE                | ST DATA                               |                                             |                                        |                  |         |
| Compression Device ID #       10       17       Readout Device ID #       10         Balance ID #       1/7       Oven ID #       12/13/14         Maximum Load at Failure, Ibf       790       Failure Code       3         Specimen Cross-sectional Area, in ² 7.07       Failure Code       3         Compressive Strength at Failure, psi       112       Failure Code       3         Conversion Factor for Height to Diameter Ratio       1.00       Failure Sketch         Reported Compressive Strength at Failure, psi       112       Failure Sketch         word 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear         REMARKS       REMARKS       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Compression Device ID #       10       10       10         Balance ID #       1/7       Readout Device ID #       10         Oven ID #       12/13/14       0       12/13/14         aximum Load at Failure, lbf       790       Failure Code       3         pecimen Cross-sectional Area, in ² 7.07       Failure Code       3         ompressive Strength at Failure, psi       112       Failure Code       3         onversion Factor for Height to Diameter Ratio       1.00       Failure Sketch       Failure Sketch         oble 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Failure Type:       Cone and Shear         REMARKS       REMARKS       Failure Type:       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         | Load Cell ID #                        | ¥. <b>Г</b>                           | 11,               |                                       | Diaita                                      | al Caliper ID #                        | 16               |         |
| Balance ID #       1/7       Oven ID #       12/13/14         Maximum Load at Failure, Ibf       790       Failure Code       3         Specimen Cross-sectional Area, in ² 7.07       Failure Code       3         Compressive Strength at Failure, psi       112       Failure Code       3         Conversion Factor for Height to Diameter Ratio       1.00       Failure Sketch         Reported Compressive Strength at Failure, psi       112       Failure Sketch         Wote 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Balance ID #       1/7       Oven ID #       12/13/14         aximum Load at Failure, lbf       790       Failure Code       3         pecimen Cross-sectional Area, in ² 7.07       Failure Code       3         ompressive Strength at Failure, psi       112       Failure Code       3         eported Compressive Strength at Failure, psi       112       Failure Sketch       Failure Sketch         obje 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch       Failure Sketch         DESCRIPTION       DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       EMARKS       Cone and Shear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
| Specimen Cross-sectional Area, in ² Compressive Strength at Failure, psi Conversion Factor for Height to Diameter Ratio Reported Compressive Strength at Failure, psi Note 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42) DESCRIPTION Failure Type: Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | pecimen Cross-sectional Area, in ² 7.07         ompressive Strength at Failure, psi       112         onversion Factor for Height to Diameter Ratio       1.00         eported Compressive Strength at Failure, psi       112         object 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:         Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         | •                                     |                                       | 1/7               |                                       |                                             | Oven ID #                              | 12/13/14         |         |
| Specimen Cross-sectional Area, in ² Compressive Strength at Failure, psi Conversion Factor for Height to Diameter Ratio Reported Compressive Strength at Failure, psi Note 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42) DESCRIPTION Failure Type: Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | pecimen Cross-sectional Area, in ² 7.07         ompressive Strength at Failure, psi       112         onversion Factor for Height to Diameter Ratio       1.00         eported Compressive Strength at Failure, psi       112         object 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:         Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
| Specimen Cross-sectional Area, in ² Compressive Strength at Failure, psi Conversion Factor for Height to Diameter Ratio Conversion Factor for Height to Diameter Ratio Conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42) DESCRIPTION Failure Type: Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | pecimen Cross-sectional Area, in ² 7.07         ompressive Strength at Failure, psi       112         onversion Factor for Height to Diameter Ratio       1.00         eported Compressive Strength at Failure, psi       112         obte 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:         Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Maximum L               | oad at Failure,                       | lbf                                   | -                 | 790                                   |                                             |                                        |                  |         |
| Compressive Strength at Failure, psi       112         Conversion Factor for Height to Diameter Ratio       1.00         Reported Compressive Strength at Failure, psi       112         Note 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:         Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ompressive Strength at Failure, psi       112         onversion Factor for Height to Diameter Ratio       1.00         eported Compressive Strength at Failure, psi       112         onte 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:         Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Specimen (              | coss-sectional                        | Area in ²                  |                   | 7.07                                  |                                             | Failure Code                           | 3                |         |
| Conversion Factor for Height to Diameter Ratio  Reported Compressive Strength at Failure, psi  Note 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and edd. correction per ASTM C42) DESCRIPTION  Failure Type: Cone and Shear USCS (ASTM D2487: D2488)  REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | onversion Factor for Height to Diameter Ratio  eported Compressive Strength at Failure, psi  tote 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42) DESCRIPTION  Failure Type: Cone and Shear  USCS (ASTM D2487: D2488)  REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -                       |                                       |                                       | _                 |                                       |                                             | . <b>L</b>                             |                  |         |
| Reported Compressive Strength at Failure, psi       112       Failure Sketch         Vote 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Sketch         DESCRIPTION       Failure Type:       Cone and Shear         USCS (ASTM D2487: D2488)       Cone and Shear         REMARKS       REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | eported Compressive Strength at Failure, psi       112       Failure Sketch         ote 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)       Failure Type:         DESCRIPTION       Failure Type:         Cone and Shear         USCS (ASTM D2487: D2488)         REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         | -                                     |                                       | tio               |                                       |                                             |                                        |                  |         |
| Note 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42)<br>DESCRIPTION<br>Failure Type:<br>Cone and Shear<br>USCS (ASTM D2487: D2488)<br>REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ofe 2: * - A conversion factor based on H/D=1.15 (C.F908 as 100% and add. correction per ASTM C42) DESCRIPTION Failure Type: Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | •                       |                                       |                                       |                   |                                       |                                             | Fe                                     | alure Sket       | ch      |
| DESCRIPTION Failure Type: Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | DESCRIPTION Failure Type: Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | •                       | -                                     | -                                     |                   |                                       | n per ASTM C4                               | _                                      | 7                |         |
| Failure Type:<br>Cone and Shear<br>REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Failure Type:<br>Cone and Shear<br>USCS (ASTM D2487: D2488)<br>REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                                       |                                       |                   |                                       |                                             | ~/                                     |                  |         |
| Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       |                   | <u> </u>                              |                                             | 1                                      | $\times$         |         |
| Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Cone and Shear USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       | -                 |                                       |                                             |                                        | $/$ $\backslash$ |         |
| USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | USCS (ASTM D2487: D2488) REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         | 1                                     |                                       |                   |                                       |                                             |                                        | Y                |         |
| REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         | L                                     |                                       |                   |                                       | ·                                           | j c                                    | one and S        | Shear   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       | USCS                                  | (ASTM D2487: E    | 02488)                                |                                             |                                        |                  |         |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       | REMARKS           |                                       |                                             |                                        |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         | <b></b>                               | <u> </u>                              |                   | · · · · · · · · · · · · · · · · · · · | <u>-</u>                                    | ]                                      |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       |                   |                                       |                                             | 1                                      |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       |                   |                                       |                                             | ]                                      |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         | · · · · · · · · · · · · · · · · · · · | · · · ·                               | <u></u>           | <u></u>                               |                                             | 1                                      |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                                       |                                       |                   |                                       |                                             |                                        |                  |         |

|                             |                                        | MELY                                          | 1874 Forge Str                | eet Tucker, GA    | 30084                             | F                          |          |
|-----------------------------|----------------------------------------|-----------------------------------------------|-------------------------------|-------------------|-----------------------------------|----------------------------|----------|
| 1                           | <u>ĉe l st</u>   En                    | GINEERING                                     | Phone: 770-93                 | 8-8233            |                                   | Tested By                  | RI       |
|                             | <b>So</b> :                            | <b>IL</b>                                     | Fax: 770-923-8                | 973               |                                   | Date                       | 07/11/12 |
|                             | <b>T</b> E                             | STS, LLC                                      | Web: <u>www.tes</u>           | -lic.com          | ANDH OF RE                        | Checked By                 | 18       |
| Client Pr. #                |                                        | 2088/6.0                                      |                               |                   | Lab. PR. #                        | 1230-02-1                  | -0       |
| Pr. Name                    | Former N                               | orth Plant MGP Site -I                        | SS Treatability S             | tudy              | S. Type                           | Mold                       |          |
| Sample ID                   |                                        | 794/Composite Area A                          |                               |                   | Depth/Elev.                       |                            |          |
| Subsample                   |                                        | 3                                             |                               |                   | Add. Info                         | Curing Age: 14 Da          | ys       |
|                             | ASTM D 1633                            | : Standard Test Met                           | hods for Comp                 | ressive Strength  | of Molded Soil-Co                 | ement Cylinders            |          |
|                             |                                        |                                               | метнор                        | В                 | ]                                 |                            | ~        |
|                             |                                        |                                               | )                             |                   |                                   |                            |          |
| Initial Height              | SAMPLE DATA                            | 5.618                                         |                               |                   | ENT DETERMINA<br>mple and Tare, g | 1385.90                    |          |
| Initial Diame               |                                        | 3.010                                         |                               |                   | mple and Tare, g                  | 1126.80                    |          |
| Height-to-Dia               |                                        | 1.87                                          |                               | lass of Tare, g   |                                   | 206.70                     |          |
| Area, in ²       |                                        | 7.12                                          | n [                           | loisture, %       |                                   | 28.2                       |          |
| Volume, in ³     |                                        | 39.98                                         | ] .                           |                   | ·                                 |                            |          |
| Mass of Sam                 |                                        | 1180.30                                       | . ∧                           | lote 1: Water cor | ntent was obtained a              | fter shear from partial sa | mple.    |
| Wet Density,                |                                        |                                               | 4                             |                   |                                   |                            |          |
| Dry Density,<br>Machine Spe |                                        | <u>87.7</u><br>0.050                          |                               |                   |                                   | · .                        |          |
| Strain rate, %              |                                        | 0.89                                          | · ·                           |                   |                                   |                            |          |
|                             |                                        | · ·                                           | -                             |                   |                                   |                            |          |
|                             |                                        | · .                                           | TEST                          | ATA               | :                                 |                            |          |
|                             | Load Cell ID #                         | 11                                            | 1                             |                   | Digital Cal                       | iper ID # 16               |          |
|                             | Compression Device                     |                                               | 1                             |                   | Readout De                        |                            |          |
|                             | Balance ID #                           | 1/7                                           | ]                             |                   | C                                 | ven ID # 12/13/14          | ,        |
|                             |                                        |                                               |                               | · · ·             | -                                 | ,                          |          |
| Maximum Lo                  | ad at Failure, lbf                     |                                               | -<br>-                        | 1626              |                                   |                            |          |
| Specimen Ci                 | ross-sectional Area,                   | in ²                               | 1                             | 7.12              | Failu                             | ire Code 3                 |          |
| -                           | e Strength at Failure,                 |                                               | -                             | 229               | 1                                 |                            |          |
|                             | Factor for Height to [                 | •                                             | · F                           | 1.00              | 1                                 |                            |          |
|                             | ompressive Strengt                     |                                               | i i                           | 229               | 1                                 | Failure Sketc              | :h       |
|                             | onversion factor based                 |                                               | . <b>L</b><br>108 as 100% and |                   | Der ASTM C42                      |                            |          |
|                             |                                        |                                               | RIPTION                       |                   | ,                                 |                            |          |
|                             | ······································ | <u>, , , , , , , , , , , , , , , , , , , </u> |                               | 1990 a            |                                   |                            |          |
|                             |                                        | •                                             |                               |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   | Failu                             | Ire Type:                  |          |
| · ·                         |                                        |                                               |                               |                   |                                   | Cone and Si                | near     |
|                             |                                        | USCS (ASTM                                    | D2487: D248                   | 8)                | -                                 |                            |          |
|                             |                                        |                                               | L                             |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   |                                   |                            |          |
| i                           | ·                                      |                                               | IARKS                         |                   | <b></b>                           |                            |          |
|                             |                                        | ÷ .                                           |                               |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   |                                   |                            |          |
| l                           | L                                      |                                               |                               | - <u></u> -       |                                   |                            |          |
|                             |                                        |                                               |                               |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   | · · · · · ·                       |                            |          |
|                             |                                        | · .                                           |                               |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   |                                   |                            |          |
| •                           |                                        | `                                             |                               |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   |                                   |                            |          |
|                             |                                        |                                               |                               |                   |                                   | •                          |          |
|                             |                                        |                                               |                               |                   |                                   |                            |          |



|              |            | î           | 1                | TIME           |                          | 1874 For     | ge Street Tu        | <br>cker, GA 3008 | 34                   | · · · ·       |                      | · · · · · · · · · · · · · · · · · · · |                    |                                    |
|--------------|------------|-------------|------------------|----------------|--------------------------|--------------|---------------------|-------------------|----------------------|---------------|----------------------|---------------------------------------|--------------------|------------------------------------|
|              | T.E.       | I <u>st</u> | 1                | ENGIN          | EERING                   | Phone: 7     | 70-938-8233         | A                 |                      |               |                      |                                       | Tested By          | EB                                 |
|              |            |             |                  | Soil           |                          | Fax: 770-    | 923-8973            | A                 |                      |               |                      |                                       | Date               | 07/03/12                           |
|              |            |             | ł                | TESTS          | , LLC                    | Web: www     | w.test-lic.com      | , AAS1,0          | 1.2169               |               |                      |                                       | Checked By         | 18                                 |
| Client Pr. # |            |             |                  |                | 2088/6.0                 |              |                     |                   |                      | Lab. PR. #    |                      | 1230-02-                              | 1                  |                                    |
| Pr. Name     |            |             | Fo               |                | lant MGP Site -          |              |                     |                   |                      | S. Type       | ·                    | Mold                                  |                    |                                    |
| Sample ID    |            |             |                  | <u>13794/C</u> | composite Area           | A, B, C, D)- | 5-1                 |                   |                      | Depth/Elev.   | <u> </u>             |                                       |                    |                                    |
| Subsample    |            |             |                  |                | 5                        |              |                     |                   |                      | Add. Info     |                      | Curing Age: 7                         | Days               |                                    |
|              |            |             |                  | ASTM D         |                          |              |                     |                   | -                    |               | •                    | Saturated Porous                      |                    |                                    |
|              |            |             |                  |                | Materials L              | Ising a Fl   |                     |                   | eter (Met            | hod D, Con    | stant Rate of        | Flow)                                 |                    |                                    |
| i ir         | nitial Sar | mple Dat    | ta (Befor        | e Test)        |                          |              | Test Dat            | a                 | _                    | ſ             |                      | Final Data (After Tes                 | it)                |                                    |
| Height       |            | 2.806       | in               | 7.13 0         | m Speed                  |              |                     | 7                 |                      | Į             |                      |                                       |                    |                                    |
| Diameter     |            | 3.005       | lin              |                | m Board N                |              |                     | 5                 |                      |               | ght of Sample        | 2.798 in                              | 7.11 cm            |                                    |
| Area         |            |             | lín ² |                | cm ² Cell Nur |              |                     | 2                 | · ·                  |               | meter of Sample      |                                       | 7.61 cm            |                                    |
| Volume       |            | ·····       | cm ³  | 0.0115 f       |                          | mp Number    |                     | 2B                | 3                    | Area          | 7.05 in ² |                                       |                    | []                                 |
| Mass         | ••         | 579.60      | 9                | 1.28           |                          | •            | •                   | 1.79E-03          | cm ³ /sec | Volume.       | 323.02 cm            |                                       | Dry Density        | 88.4 pcf<br>145.37 cm ³ |
| Specific Gra |            |             | (Assume          | d)             | B - Valu                 | -            |                     | 0.95              |                      | Mass          | 596.10 g             | 1.31 lb                               | Vol. of Voids      |                                    |
| Dry Density  |            | 87.4        | pcf              |                | Cell Pres<br>Back Pres   |              |                     | 105.0             | psi<br>psi           |               |                      |                                       | Vol. of Solids     | 177.65 cm ³             |
|              | Mois       | sture Cont  | tent             |                |                          | g (Effective | Bronnuro            | 15.0              | psi<br>psi           |               | Moistur              | re Content                            | Saturation         | 95.4 %                             |
| Mass of wet  |            |             | 579.60           | ]a             | Max Hea                  |              | ) Flessule          | 31,65             | icm                  | Mass of wet   | sample & tare        | 674.00 g                              | Saturation         | <u> </u>                           |
| Mass of dry  | •          | ,           | 456.60           | -19<br>19      | Min Hea                  |              |                     | 30.25             |                      | Mass of dry s | •                    | 535.60 g                              |                    |                                    |
| Mass of tare | •          |             | 0.00             | g              |                          | m Gradient   |                     | 4.45              |                      | Mass of tare  |                      | 79.00 g                               |                    |                                    |
| % Moisture   |            |             | 26.9             |                | Minimun                  | n Gradient   |                     | 4.26              | 1                    | % Moisture    |                      | 30.3                                  |                    |                                    |
| TIME         | FUNCT      | ION         | Δt               | READING        | Head                     | Gradient     | Temp.               | PERME             | ABILITY              | (cm/sec)      | No                   | te: Deaired Water Used for F          | Permeability Test. |                                    |
| DATE         | HOUR       | MIN         | (sec)            | (psi)          | (cm)                     |              | T _x (°C) | @ T _x  | R _T       | @ 20 °C       | ]                    | DESCRIPTION                           | -                  |                                    |
| 07/03/12     | 8          | D           |                  | 0.44           | 30.95                    | 4.35         | 27.0                |                   | -                    | -             | NA                   |                                       | ` ι                | JSCS                               |
| 07/03/12     | 8          | 10          | 600              | 0.43           | 30.25                    | 4.26         | 27.0                | 9.16E-06          | 0.850                | 7.79E-06      |                      |                                       | (ASTM              | D2487;2488)                        |
| 07/03/12     | 8          | 20          | 600              | 0.43           | 30.25                    | 4.26         | 27.0                | 9.26E-06          | 0.850                | 7.88E-06      |                      | <u>.</u>                              |                    | NA .                               |
| 07/03/12     | 8          | 30          | 600              | 0.45           | 31.65                    | 4.45         | 27.0                | 9.05E-06          | 0.850                | 7.70E-06      | *                    | REMAR                                 | RKS                |                                    |
| 07/03/12     | 8          | 40          | 600              | 0,44           | 30.95                    | 4.35         | 27.0                | 8.95E-06          | 0.850                | 7.61E-06      | *                    |                                       | •                  |                                    |
| 07/03/12     | 8          | 50          | 600              | 0.45           | 31.65                    | 4.45         | 27.0                | 8.95E-06          | 0.850                | 7.61E-06      | *                    |                                       |                    |                                    |
| 07/03/12     | 9          | 0           | 600              | 0.44           | 30,95                    | 4.35         | 27.0                | 8.95E-06          | 0.850                | 7.61E-06      | *                    | · · · ·                               |                    |                                    |
|              |            |             |                  |                | Reported                 | d Average F  | lydraulic Con       | ductivity*        |                      | 7.6E-06       | cm/sec               |                                       |                    | -                                  |
| Flow pump I  | D #        | 2           | 44               | ] 8            | Balance ID #             | 1/6/7        | ].                  | Differential F    | Pressure T           | ransducer ID  | #                    | 263                                   |                    |                                    |
| Thermomete   | er ID #    | 3           | 77               | ]. (           | Oven ID #                | 14/15        |                     | Board Press       | ure Trans            | ducer ID #    |                      | 216                                   |                    |                                    |
| Syringe ID # | ŧ          | 2           | 46               | ]              |                          |              |                     | Pore Pressu       | ire Transd           | ucer ID #     |                      | 28                                    | /                  |                                    |

|                  |            |               |                  |            |                                                 |                    |                       | •                |                      |                 |                      |                                       | •                               |                                                         |
|------------------|------------|---------------|------------------|------------|-------------------------------------------------|--------------------|-----------------------|------------------|----------------------|-----------------|----------------------|---------------------------------------|---------------------------------|---------------------------------------------------------|
|                  |            |               |                  |            |                                                 |                    |                       |                  |                      |                 |                      | · · · · · · · · · · · · · · · · · · · |                                 |                                                         |
|                  |            | Ŧ             | 1                | TIME       | LY                                              | 1874 For           | ge Street Tu          | cker, GA 300     | 84                   |                 |                      |                                       |                                 | :                                                       |
|                  | TE         | <u>Lst</u>    |                  | ENGIN      | JEERING                                         | Phone: 7           | 70-938-8233           |                  |                      | 1               | ·                    |                                       | Tested By                       | EB                                                      |
|                  |            | X             |                  | Soll       |                                                 | Fax: 770-          | 923-8973              | A DET S          |                      |                 |                      |                                       | Date                            | 07/10/12                                                |
|                  |            |               | ł                | TESTS      | , LLC                                           | Web: www           | w.test-llc.com        | · ·              |                      |                 |                      |                                       | Checked By                      | 18                                                      |
| Client Pr. #     |            |               |                  |            | 2088/6.0                                        |                    |                       |                  |                      | Lab. PR. #      |                      | 1230-02-1                             |                                 |                                                         |
| Pr. Name         |            |               | Foi              |            | lant MGP Site -I                                |                    |                       |                  |                      | S. Type         |                      | Mold                                  |                                 |                                                         |
| Sample ID        |            | ·             |                  | 13794/C    | omposite Area A                                 | <u>, B, C, D)-</u> | 5-1                   |                  |                      | Depth/Elev.     |                      | -<br>                                 |                                 |                                                         |
| Subsample        |            |               |                  | · · · · ·  | 6                                               |                    |                       |                  |                      | Add. Info       |                      | Curing Age: 14 E                      |                                 |                                                         |
| ł                |            |               |                  | ASTM D     | •                                               |                    |                       |                  | -                    |                 |                      | Saturated Porous                      |                                 |                                                         |
|                  |            |               |                  |            | Materials U                                     | sing a Fl          |                       |                  | eter (Met            | hod D, Con<br>I | stant Rate of        |                                       |                                 |                                                         |
| 1 1              | nitial Sar |               | ta (Befor        | e Test)    |                                                 |                    | Test Dat              | a<br>            | 1                    |                 |                      | Final Data (After Test)               | ).                              |                                                         |
| Height           |            |               | in               |            | m Speed                                         |                    |                       | 7                |                      |                 |                      | · · · · · · · · · · · · · · · · · · · | r                               |                                                         |
| Diameter         |            | 3.003         | lin<br>. 2       |            | m Board Nu                                      |                    |                       | 8                | 4                    |                 | ght of Sample        | 2.740 in                              | 6.96 cm                         |                                                         |
| Area             |            | 7.08          | lin ² |            | m ² Cell Num                         |                    |                       | 19               | ł                    | 1 -             | 7.06 In ² |                                       | 7.61 cm                         |                                                         |
| Volume           |            |               | cm ³  | 0.0113 fi  |                                                 | np Number          | •                     | 2A               | cm ³ /sec | Area            |                      |                                       | T                               |                                                         |
| Mass             |            | 574.40        | g                | 1.27  lt   | <ul> <li>Flow Pun</li> <li>B - Value</li> </ul> | •                  |                       | 1.79E-03<br>0.95 | cm /sec              | Volume          | 316.96 cm            |                                       | Dry Density                     | 88.2 pcf<br>142.89 cm ³                      |
| Specific Gra     | •          | 2.575<br>87.5 | (Assume          | a)         | Cell Pres                                       |                    |                       | 105.0            | DSI                  | Mass            | 584.50 g             | 1.29 lb                               | Vol. of Volds<br>Vol. of Solids | <u>142.89</u> cm ³<br>174.07 cm ³ |
| Dry Density      |            | 07.5          | Трсі             |            | Back Pre                                        |                    |                       | 90.0             | ipsi                 | ļ               |                      |                                       | Void Ratio                      | 0.82                                                    |
|                  | Mois       | ture Con      | tent             |            |                                                 |                    | ) Pressure            | 15.0             | losi                 |                 | Moistur              | e Content                             | Saturation                      | 95.4 %                                                  |
| <br> Mass of wel | sample &   | tare          | 574.40           | <b>1</b> a | Max Hear                                        |                    |                       | 47.83            | lcm ·                | Mass of wet:    | sample & tare        | 674.50 a                              |                                 | //                                                      |
| Mass of dry      | •          |               | 447.30           | q          | Min Heac                                        | -<br>1 ·           |                       | 45.02            | cm                   |                 | sample & tare        | 538.50 g                              |                                 | •                                                       |
| Mass of tare     | -          |               | 0.00             | g          | Maximum                                         | Gradient           | · .                   | 6.87             | 1.                   | Mass of tare    | -                    | 91.20 g                               | ·                               |                                                         |
| % Moisture       |            |               | 28.4             | 1          | Minimum                                         | Gradient           |                       | 6.47             | 1                    | % Moisture      |                      | 30.4                                  |                                 |                                                         |
| TIME             | FUNCT      | ION           | Δt               | READING    | Head                                            | Gradient           | Temp.                 | PERME            | ABILITY              | (cm/sec)        | Not                  | te: Deaired Water Used for Pe         | rmeability Test.                |                                                         |
| DATE             | HOUR       | MIN           | (sec)            | (psi)      | (cm)                                            | <br>               | T _x ( °C ) | @ T _x | - R _T     | @ 20 °C         | · _                  | DESCRIPTION                           |                                 |                                                         |
| 07/10/12         | 7          | Ο             | -                | 0.65       | 45.72                                           | 6.57               | 27.0                  | -                | · _                  |                 | NA                   | · · · · · · · · · · · · · · · · · · · | U                               | scs                                                     |
| 07/10/12         | 7          | 10            | 600              | 0.64       | 45.02                                           | 6:47               | 27.0                  | 6.04E-06         | 0.850                | 5.13E-06        |                      |                                       | (ASTM E                         | 02487;2488)                                             |
| 07/10/12         | 7          | 20            | 600              | 0.64       | 45.02                                           | 6.47               | 27.0                  | 6.08E-06         | 0.850                | 5.17E-06        |                      | ·                                     | 1                               | NA                                                      |
| 07/10/12         | 7          | 30            | 600              | 0.67       | 47.13                                           | 6.77               | 27.0                  | 5.94E-06         | 0.850                | 5.05E-06        | *                    | REMARK                                | S                               |                                                         |
| 07/10/12         | 7          | 40            | 600              | 0.64       | 45.02                                           | 6.47               | 27.0                  | 5.94E-06         | 0.850                | 5.05E-06        | *                    | -                                     |                                 |                                                         |
| 07/10/12         | 7          | 50            | 600              | 0.66       | 46.42                                           | 6.67               | 27.0                  | 5.99E-06         | 0.850                | 5.09E-06        | ]* (                 |                                       |                                 |                                                         |
| 07/10/12         | 8          | 0             | 600              | 0.68       | , 47.83                                         | 6.87               | 27.0                  | 5.81E-06         | 0.850                | 4.94E-06        | *                    |                                       | I                               |                                                         |
|                  |            |               |                  |            | Reported                                        | Average F          | lydraulic Con         | ductivity*       |                      | 5.0E-06         | cm/sec               |                                       |                                 | <u></u>                                                 |
| Flow pump I      | D#         | 2             | 44               | ] в        | alance ID #                                     | 1/6/7              | · ·                   | Differential P   | Pressure T           | ransducer ID :  | -<br>#               | 262                                   |                                 |                                                         |
| Thermomete       | er ID #    | 3             | 77               | ] c        | ven ID #                                        | 14/15              |                       | Board Press      | ure Transo           | ducer ID #      |                      | 215                                   |                                 |                                                         |
| Syringe ID #     | .          | 24            | 45               |            |                                                 |                    |                       | Pore Pressu      | re Transdu           | ucer ID #       |                      | 28                                    |                                 |                                                         |
| 1 *              |            |               |                  | •          |                                                 |                    |                       |                  |                      |                 |                      | <u></u>                               |                                 |                                                         |

|                          |            |                      |                 |              |                             |              |                     |                  |                      |                        |               |                   |                          | •                        |                        |
|--------------------------|------------|----------------------|-----------------|--------------|-----------------------------|--------------|---------------------|------------------|----------------------|------------------------|---------------|-------------------|--------------------------|--------------------------|------------------------|
|                          |            |                      |                 |              |                             |              |                     |                  |                      |                        |               | •                 |                          |                          | •                      |
|                          |            |                      |                 | •            |                             |              |                     |                  |                      |                        |               |                   |                          |                          |                        |
|                          |            |                      |                 | TIMEI        | v                           | 1974 505     | ge Street Tud       | ker CA:200       |                      | ·····                  |               |                   |                          |                          | `- <u>-</u>            |
|                          |            | ╇                    |                 |              |                             |              |                     | Ker, GA 300      | 54                   | •                      | •             |                   |                          |                          | r                      |
|                          | ŤÈ.        | L <u>st</u>          |                 | ENGIN        | EERING                      | Phone: 77    | 70-938-8233         |                  |                      |                        |               |                   |                          | Tested By                | EB                     |
|                          |            | X                    |                 | Soll         |                             | Fax: 770-    | 923-8973            | A                |                      |                        |               |                   |                          | Date                     | 07/24/12               |
|                          | 6          | $\underline{\gamma}$ |                 | Tests,       | TIC                         | Mobrum       | w.test-llc.com      |                  | i * \$               |                        |               |                   |                          | Cheeked Du               | 18                     |
|                          |            |                      |                 |              |                             | <u>vveb.</u> | w.test-nc.com       |                  |                      |                        | <u> </u>      |                   | 4000.00.4                | Checked By               | -0                     |
| Client Pr. #<br>Pr. Name |            |                      |                 | mar North Di | 2088/6.0<br>ant MGP Site -l | SS Trootak   | tithe Ofundue       |                  |                      | Lab. PR. #             |               | ·                 | <u>1230-02-1</u><br>Mold |                          |                        |
| Sample ID                |            |                      | F01             |              | omposite Area A             |              |                     |                  |                      | S. Type<br>Depth/Elev. |               |                   | Mula                     |                          |                        |
| Subsample                |            |                      |                 | 101040       | 7                           | , 0, 0, 0,-  |                     |                  |                      | Add. Info              |               | Cu                | ing Age: 28              | Davs                     | · - <u></u>            |
|                          |            |                      |                 |              |                             |              | <u>,</u>            |                  |                      |                        |               |                   |                          |                          |                        |
|                          |            |                      |                 | ASTM D       |                             |              |                     |                  | -                    |                        | -             | Saturated Poro    | us                       |                          |                        |
|                          |            |                      |                 |              | Materials U                 | sing a Fl    |                     |                  | eter (Met            | hod D, Cons            | stant Rate of |                   |                          |                          |                        |
| l Ir                     | nitial San | nple Dat             | a (Befor        | e Test)      |                             |              | Test Data           | a                |                      | ]                      |               | Final Data        | (After Tes               | t)                       |                        |
| Height                   |            | 2.765                | lin             | 7.02 c       | m Speed                     |              |                     | 8                | ]                    | Į .                    |               | •                 |                          |                          |                        |
| Diameter                 |            | 3.004                | lin             | 7.63 c       | m Board Nu                  | mber         |                     | · 7              |                      | Average Heig           | ht of Sample  | 2.760             | ]in                      | 7.01 cm                  |                        |
| Area                     |            | 7.09                 | in ² | 45.73 c      | m ² Čell Num     | ber          |                     | 2                | 1                    | Average Diarr          | •             | e 2.999           | lin                      | 7.62 cm                  |                        |
| Volume                   |            |                      | cm ³ | 0.0113 ft    | ³ Flow Pur       | np Number    | · ·                 | 2A               | 1.                   | Area                   | 7.06 in       |                   | cm ²          | <u></u>                  |                        |
| Mass                     |            | 583.10               | 9               | 1.29         |                             | •            |                     | 8.96E-04         | cm ³ /sec | Volume                 | 319.49 cr     |                   | ft ³          | Dry Density              | 90.4 pcf               |
| Specific Gra             | wity       | 2,575                | (Assume         | d)           | B - Value                   |              | •                   | 0.95             | 1                    | Mass                   | 597.80 g      | 1.32              | lb                       | Vol. of Voids            | 139.78 cm ³ |
| Dry Density              | -          | 89.8                 | l<br>pct        | -7           | Cell Pres                   | sure         |                     | 105.0            | lpsi                 | } L                    |               |                   | <b>.</b>                 | Vol. of Solids           | 179.71 cm ³ |
|                          | i          |                      | 1               |              | Back Pre                    |              |                     | 90.0             | psi                  |                        |               |                   |                          | Void Ratio               | 0.78                   |
| <b>}</b> .               | Mois       | ture Con             | tent            |              |                             |              | ) Pressure          | 15.0             | psi                  | }                      | Moistu        | re Content        |                          | Saturation               | 96.6 %                 |
| Mass of we               | sample &   | tare                 | 583.10          | ]g           | Max Hea                     | -            | ,                   | 40.09            | cm                   | Mass of wet s          | ample & tare  | 693.70            | <b>1</b> a               |                          |                        |
| Mass of dry              | -          |                      | 461.90          |              | Min Head                    |              |                     | 39.39            | icm                  | Mass of dry s          | •             | 558.90            |                          |                          |                        |
| Mass of tare             | -          |                      | 0.00            | a            |                             | Gradient     |                     | 5.72             |                      | Mass of tare           |               | 97.00             |                          |                          |                        |
| % Moisture               |            |                      | 26.2            | 1            | Minimum                     |              |                     | 5.62             |                      | % Moisture             | ·             | 29.2              | 1                        |                          |                        |
|                          | FUNCTI     | <u></u>              | Δt              | READING      | Head                        | Gradient     | Temp.               |                  |                      | (cm/sec)               | N             | ote: Dealred Wate | r Llead for P            | ermeshilih <i>i</i> Test |                        |
|                          |            |                      | 1               | 1            |                             | Gradien      | T _x (°C) |                  | · · · · ·            | @ 20 °C                | 191           |                   |                          | enneability rest.        |                        |
| DATE                     | HOUR       | MIN                  | (sec)           | (psi)        | (cm)                        |              | <u> </u>            | @ T _x | R _T       | <u>@20 C</u>           | N             | DESCRIPT          |                          | <b>-</b> ,               |                        |
| 07/24/12                 | 7          | 0                    |                 | 0.57         | 40.09                       | 5.72         | 27.0                | -                | -                    |                        |               |                   |                          | 1                        | JSCS                   |
| 07/24/12                 | 7          | 10                   | 600             | 0.56         | 39.39                       | 5.62         | 27.0                | 3.47E-06         | 0.850                | 2.95E-06               | ·             |                   |                          | (ASTM                    | D2487;2488)            |
| 07/24/12                 | 7          | 20                   | 600             | 0.56         | 39.39                       | 5.62         | 27.0                | 3.50E-06         | 0.850                | 2.97E-06               |               | ·                 | <u> </u>                 |                          | NA                     |
| 07/24/12                 | 7          | 30                   | 600             | 0.57         | 40.09                       | 5.72         | 27.0                | 3.47E-06         | 0.850                | 2.95E-06               | *             |                   | REMAR                    | KS                       |                        |
| 07/24/12                 | 7          | 40                   | 600             | 0.56         | 39,39                       | 5.62         | 27.0                | 3.47E-06         | 0.850                | 2.95E-06               | *             |                   |                          |                          | ·                      |
| 07/24/12                 | 7.         | 50                   | 600             | 0.57         | · 40.09                     | 5.72         | 27.0                | 3.47E-06         | 0.850                | 2.95E-06               | *             |                   |                          |                          | 1                      |
| 07/24/12                 | 8          | 0                    | 600             | 0.57         | 40.09                       | 5.72         | 27.0                | 3.44E-06         | 0.850                | 2.92E-06               | *             | _                 |                          |                          |                        |
|                          |            |                      |                 |              | Reported                    | Average H    | lydraulic Con       | <u> </u>         |                      |                        | cm/séc        | <u></u>           |                          |                          |                        |
| Flow pump I              | ש ה        | 2.                   | 44              | ] _          | alance (D #                 | 1/6/7        | 1                   |                  | Dreesure T           | ransducer ID #         |               | 262               | 1                        |                          |                        |
| Thermomete               |            |                      | 77              |              | Ven ID #                    |              | 1                   |                  |                      |                        | r             |                   | 1                        | ,                        |                        |
|                          |            |                      |                 |              | Wen ID #                    | 14/15        | 1                   | Board Press      |                      | ,                      |               | 215               | ł                        |                          |                        |
| Syringe ID #             | F _ ]      | 2                    | 45              | J            |                             |              |                     | Pore Pressu      | ire i ransdi         | ucer ID #              |               | 28                | 1 -                      |                          |                        |
| 1                        | -          |                      |                 |              |                             |              |                     |                  |                      |                        |               |                   |                          |                          |                        |

| ſ                                                                                           | re sr                                                                    | TIMELY<br>Engineering                                                                | 1874 Forge S<br>Phone: 770-9 | Street Tucker, G                              | A 30084                  |                                                | Tested By                            | RI         |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------|--------------------------|------------------------------------------------|--------------------------------------|------------|
|                                                                                             | X                                                                        | SOIL                                                                                 | Fax: 770-923                 | -8973                                         |                          |                                                | Date                                 | 07/03/12   |
| Ĺ                                                                                           |                                                                          | TESTS, LLC                                                                           | Web: <u>www.te</u>           | st-lic.com                                    |                          |                                                | Checked By                           | 18         |
| Client Pr. #                                                                                |                                                                          | 2088/6.0                                                                             |                              |                                               | Lab. PR. #               |                                                | 1230-02-1                            |            |
| Pr. Name                                                                                    | Fo                                                                       | ormer North Plant MGP Site -                                                         |                              | Study                                         | S. Type                  |                                                | Mold                                 |            |
| Sample ID<br>Subsample                                                                      |                                                                          | 13794/Composite Area /<br>2                                                          | а, в, с, D)-5-1              |                                               | Depth/Elev.<br>Add. Info | Cur                                            | -<br>ing Age: 7 Da                   |            |
|                                                                                             |                                                                          |                                                                                      |                              |                                               |                          |                                                |                                      | <u>,,,</u> |
|                                                                                             | ASTM                                                                     | D 1633: Standard Test Me                                                             | thods for Con<br>METHOD      |                                               | gth of Molded S          | oil-Cement Cyli                                | nders                                |            |
|                                                                                             |                                                                          |                                                                                      | WEINUD                       | <u>D</u>                                      | 、                        |                                                |                                      |            |
| Area, in ²<br>Volume, in ²<br>Mass of Sa<br>Wet Densit<br>Dry Density | eter, in<br>iameter Ratio<br>mple, g<br>y, pcf<br>y, pcf<br>peed, in/min | 5.579<br>3.007<br>1.86<br>7.10<br>39.62<br>1160.80<br>111.6<br>86.4<br>0.050<br>0.90 |                              | Mass of Dry S<br>Mass of Tare,<br>Moisture, % |                          |                                                | 1575.30<br>1314.30<br>418.40<br>29.1 | ample.     |
|                                                                                             | Load Cell ID<br>Compression<br>Balance ID #                              | Device ID # 10                                                                       |                              | ΓΟΑΤΑ                                         |                          | al Caliper ID #<br>ut Device ID #<br>Oven ID # | 10                                   |            |
| Maximum I                                                                                   | oad at Failure,                                                          | lbf                                                                                  |                              | 350                                           | - ·                      | Failure Code                                   | 3                                    | l          |
| Specimen                                                                                    | Cross-sectiona                                                           | l Area, in ²                                                              |                              | 7.10                                          |                          | Pallure Coue                                   |                                      |            |
|                                                                                             | ve Strength at I                                                         |                                                                                      |                              | 49                                            |                          | •                                              |                                      |            |
|                                                                                             | •                                                                        | ght to Diameter Ratio                                                                |                              | 1.00                                          | _                        |                                                | <b></b>                              |            |
|                                                                                             | =                                                                        | Strength at Failure, psi<br>or based on H/D=1.15 (C.F<br>DES(                        | 908 as 100% a<br>CRIPTION    | 49<br>Ind add. correctio                      | on per ASTM C4           | 2)                                             | Failure Sket                         |            |
|                                                                                             |                                                                          | -                                                                                    |                              |                                               | •                        | Failure Type:                                  | Cone and S                           | Shear      |
|                                                                                             | L                                                                        | USCS (AST                                                                            | M D2487: D24                 | 488)                                          |                          | 1                                              | 5 <b>6</b> and 6                     |            |
|                                                                                             |                                                                          |                                                                                      |                              | ]                                             |                          |                                                |                                      |            |
| -                                                                                           |                                                                          | RE                                                                                   | MARKS                        |                                               |                          |                                                |                                      |            |
|                                                                                             |                                                                          |                                                                                      |                              |                                               |                          |                                                |                                      |            |
|                                                                                             |                                                                          |                                                                                      |                              |                                               |                          | J                                              |                                      | · .        |
| 1                                                                                           |                                                                          |                                                                                      |                              |                                               |                          |                                                |                                      |            |

|                                   |                  |                         |                  |                                        | `                                 |                                        |          |
|-----------------------------------|------------------|-------------------------|------------------|----------------------------------------|-----------------------------------|----------------------------------------|----------|
|                                   | +                | TIMELY                  | 1874 Forge       | Street Tucker, G                       | A 30084                           |                                        |          |
| 17                                | È.IST.           | ENGINEERIN              | G Phone: 770     | -938-8233                              |                                   | Tested By                              | RI       |
|                                   |                  | Soil                    | Fax: 770-92      |                                        |                                   | Date                                   | 07/10/12 |
|                                   | $\triangle$      | TESTS, LLC              |                  |                                        | AASH"O FIE                        |                                        | 18       |
| Client Pr. #                      |                  | 2088                    | Web: <u>www.</u> |                                        | Lab. PR. #                        | Checked By<br>1230-02-1                | 10       |
| Pr. Name                          | <br>Fo           | mer North Plant MGP S   |                  | v Study                                | S. Type                           |                                        |          |
| Sample ID                         |                  | 13794/Composite A       |                  |                                        | Depth/Elev.                       |                                        |          |
| Subsample                         | <u> </u>         | 3                       | <u></u>          |                                        | Add. Info                         | Curing Age: 14 D                       | ays      |
|                                   | ASTM             | D 1633: Standard Test   | Methods for Co   | mpressive Streng                       | th of Molded So                   | il-Cement Cylinders                    |          |
|                                   |                  |                         | METHOD           | B                                      |                                   |                                        |          |
|                                   |                  |                         |                  |                                        |                                   |                                        | · ` ·    |
|                                   | SAMPLE DA        |                         | <u>.</u>         |                                        | TENT DETERM                       |                                        |          |
| Initial Height,<br>Initial Diamet |                  | 5.59                    |                  |                                        | Sample and Tar<br>Sample and Tare |                                        |          |
|                                   | meter Ratio      |                         |                  | Mass of Tare,                          |                                   | 203.60                                 |          |
| Area, in ²             |                  | 7.1                     |                  | Moisture, %                            | 5                                 | 29.9                                   |          |
| Volume, in ³           |                  | 39.7                    |                  | -,                                     |                                   | L                                      | •        |
| Mass of Sam                       | ple, g           | 1153                    |                  | Note 1: Water c                        | ontent was obtair                 | ed after shear from partial s          | ample.   |
| Wet Density,<br>Dry Density,      |                  | <u>110</u><br>85.       |                  |                                        |                                   |                                        |          |
| Machine Spe                       |                  | 0.05                    |                  |                                        |                                   |                                        |          |
| Strain rate, %                    |                  | 0.8                     |                  |                                        |                                   |                                        | •        |
|                                   | -                |                         | 750              | -                                      |                                   |                                        |          |
|                                   |                  |                         | IES              | T DATA                                 |                                   |                                        |          |
|                                   | Load Cell ID #   |                         |                  |                                        |                                   | Caliper ID # 16                        | ]        |
|                                   | Compression      |                         |                  |                                        | Readou                            | t Device ID # 10                       |          |
|                                   | Balance ID #     | 1/7                     | · ·              |                                        |                                   | Oven ID # 12/13/14                     | l ·      |
| Movimum Lo                        | ad at Failure,   | Ibf                     | •                | 401                                    |                                   |                                        |          |
|                                   | au al Fallure,   |                         |                  | 401                                    |                                   | Failure Code 3                         | 1        |
| Specimen Cr                       | oss-sectional    | Area, in ²   |                  | 7.11                                   |                                   |                                        |          |
| Compressive                       | Strength at F    | ailure, psi             |                  | 56                                     |                                   |                                        |          |
| Conversion F                      | actor for Heig   | ght to Diameter Ratio   |                  | 1.00                                   |                                   |                                        |          |
| Reported Co                       | mpressive S      | strength at Failure, p  | si .             | 56                                     |                                   | Failure Sket                           | tch      |
| Note 2: * - A co                  | onversion factor | r based on H/D=1.15 (C. |                  | and add. correctio                     | on per ASTM C42,                  |                                        |          |
| ſ                                 |                  | DE                      | SCRIPTION        | • •                                    | ······                            |                                        |          |
| -                                 |                  |                         | -                |                                        |                                   |                                        |          |
|                                   |                  |                         | ,                |                                        | 1                                 | Failure Type:                          | ]        |
|                                   |                  |                         |                  |                                        |                                   | Cone and S                             | Shear    |
| •                                 | : .              | USCS (AS                | STM D2487: D2    | 488)                                   | · · · · ·                         |                                        |          |
|                                   |                  |                         |                  |                                        |                                   |                                        |          |
|                                   |                  |                         | DEMARKO          |                                        |                                   |                                        |          |
| Г                                 |                  |                         | REMARKS          |                                        |                                   |                                        |          |
|                                   |                  |                         |                  |                                        | _                                 |                                        |          |
|                                   |                  |                         |                  |                                        | -                                 |                                        |          |
| Ľ                                 |                  |                         |                  | ······································ |                                   |                                        |          |
|                                   |                  |                         |                  |                                        |                                   | ······································ |          |
|                                   |                  |                         |                  | • .                                    |                                   |                                        |          |
| 1.5                               |                  |                         | •                |                                        | 1                                 |                                        |          |
|                                   |                  |                         |                  |                                        |                                   |                                        |          |
|                                   |                  |                         |                  |                                        |                                   |                                        |          |

| <b>_</b>                              |                             | TIMELY                                 | 1874 Forge Street                | Tucker, GA 30         | 084                      |                                  |                   |           |
|---------------------------------------|-----------------------------|----------------------------------------|----------------------------------|-----------------------|--------------------------|----------------------------------|-------------------|-----------|
| 7                                     | <u>ÊE. Î. Sîr</u> .         | Engineering                            | Phone: 770-938-823               |                       |                          |                                  | Tested By         | <br>RI    |
|                                       |                             | Soil                                   | Fax: 770-923-8973                |                       |                          |                                  | Date              | 07/24/12  |
| · .                                   | $\Delta$                    | TESTS, LLC                             | Web: www.test-lic.c              |                       | 84°0 FIE                 |                                  | Checked By        | 18        |
| Client Pr. #                          | i — —                       | 2088/6.0                               |                                  |                       | Lab, PR. #               |                                  | 1230-02-1         |           |
| Pr. Name                              | Fo                          | ormer North Plant MGP Site             | -ISS Treatability Study          |                       | S. Type                  |                                  | Mold              | `         |
| Sample ID<br>Subsample                |                             | 13794/Composite Area<br>4              | A, B, C, D)-5-1                  |                       | Depth/Elev.<br>Add. Info | <br>Cur                          | ring Age: 28 Da   | <u>.</u>  |
| oubsample                             | + 000 M                     |                                        |                                  |                       |                          |                                  |                   | <u>ya</u> |
|                                       | ASIM                        | D 1633: Standard Test M                | ethods for Compress              | ve Strengtn o         | i Molded So              | oil-Cement Cy                    | linders           |           |
|                                       |                             |                                        | METHOD                           | В                     |                          |                                  |                   |           |
|                                       | SAMPLE DA                   | ТА                                     | WAT                              | ER CONTEN             |                          |                                  | •                 |           |
| Initial Height                        | t, in                       | 5.614                                  | Mass                             | of Wet Sam            | ple and Ta               | re, g                            | 1352.60           |           |
| Initial Diame                         |                             | 3.010                                  |                                  | of Dry Samp           | ple and Tar              | e,g -                            | 1095.50           |           |
| Height-to-Di<br>Area, in ² | ameter Ratio                | <u> </u>                               |                                  | of Tare, g<br>ture, % |                          |                                  | 203.50<br>28.8    |           |
| Volume, in ³               |                             | 39.95                                  |                                  | ure, 70               |                          |                                  |                   |           |
| Mass of San                           |                             | 1152.00                                | Note                             | 1: Water conte        | nt was obtai             | ned after shear                  | r from partial sa | mple.     |
| Wet Density                           |                             | 109.9                                  | _                                |                       |                          |                                  |                   |           |
| Dry Density,<br>Machine Sp            |                             | 85.2<br>0.050                          |                                  |                       |                          | •                                |                   |           |
| Strain rate, 9                        |                             | 0.89                                   | _                                |                       |                          |                                  |                   |           |
|                                       |                             | . ·                                    | TEST DAT                         | A                     |                          |                                  |                   |           |
| u .                                   |                             |                                        |                                  | ·                     |                          |                                  |                   |           |
|                                       | Load Cell ID<br>Compression |                                        |                                  |                       |                          | I Caliper ID #<br>It Device ID # |                   |           |
| •                                     | Balance ID #                |                                        | -1                               |                       |                          |                                  | 12/13/14          |           |
|                                       |                             |                                        | <br>                             |                       |                          |                                  |                   |           |
| Maximum Lo                            | oad at Failure,             | lbf                                    |                                  | 511                   |                          | Failure Code                     |                   |           |
| Specimen C                            | ross-sectional              | Area, in ²                  |                                  | 7.12                  |                          |                                  | 3                 |           |
| Compressiv                            | e Strength at I             | Failure, psi                           |                                  | 72                    |                          |                                  |                   |           |
|                                       |                             | ght to Diameter Ratio                  |                                  | 1.00                  |                          |                                  |                   |           |
| -                                     | -                           | Strength at Failure, psi               |                                  | 72                    |                          |                                  | Failure Sketo     | ch        |
| Note 2: * - A c                       | conversion facto            | or based on H/D≈1.15 (C.F<br>DES       | .908 as 100% and add<br>CRIPTION | I. correction pe      | er ASTM C42              | 2)                               |                   |           |
|                                       | [                           |                                        |                                  |                       |                          |                                  |                   |           |
|                                       |                             |                                        |                                  |                       |                          |                                  |                   |           |
|                                       | [                           | 1                                      | ·                                |                       |                          | Failure Type                     |                   | /         |
|                                       | L                           | USCS (AST                              | M D2487: D2488)                  |                       |                          |                                  | Cone and S        | near      |
|                                       |                             |                                        |                                  |                       |                          |                                  |                   |           |
|                                       |                             |                                        | <u></u>                          | -                     |                          |                                  |                   |           |
|                                       | r                           |                                        | MARKS                            |                       |                          | [                                |                   |           |
|                                       |                             |                                        |                                  |                       |                          |                                  |                   | -         |
|                                       | ļ                           |                                        |                                  |                       |                          |                                  |                   |           |
|                                       |                             |                                        |                                  |                       |                          |                                  |                   |           |
|                                       |                             | ······································ | <u> </u>                         |                       |                          |                                  |                   | -         |
|                                       |                             |                                        |                                  |                       |                          |                                  |                   |           |
|                                       |                             |                                        |                                  |                       |                          |                                  |                   |           |

|                                         | -                                       | ,          |                 |           |                          |                    |                       |                  |             |                                                             | •             |                 |             |                 |                    |             |
|-----------------------------------------|-----------------------------------------|------------|-----------------|-----------|--------------------------|--------------------|-----------------------|------------------|-------------|-------------------------------------------------------------|---------------|-----------------|-------------|-----------------|--------------------|-------------|
|                                         |                                         |            |                 | ·         | ·                        |                    |                       |                  | ,ť          |                                                             |               |                 |             |                 |                    |             |
|                                         |                                         | t          |                 | TIMEL     | N                        | 1874 For           | ge Street Tuo         | cker, GA 3008    | 34          |                                                             |               |                 |             |                 |                    | -           |
|                                         | T.E.                                    | <u>sr</u>  | ·               | Engin     | EERING                   | 1                  | 70-938-8233           |                  |             |                                                             |               |                 |             |                 | Tested By          | ËB          |
|                                         |                                         | X          |                 | Soll      |                          | Fax: 770-          | 923-8973              | A                |             | }                                                           |               |                 |             |                 | Date               | 07/03/12    |
|                                         | 1                                       |            |                 | TESTS,    | LLC /                    | Web: www           | w.test-llc.com        |                  |             |                                                             |               |                 |             |                 | Checked By         | 18          |
| Client Pr. #                            |                                         |            |                 |           | 2088/6.0                 |                    |                       | ·····            |             | Lab. PR. #                                                  |               |                 |             | 1230-02-        | -1                 |             |
| Pr. Name                                |                                         |            | For             |           | ant MGP Site -           |                    |                       |                  | ,           | S. Type                                                     |               |                 |             | Mold            |                    |             |
| Sample ID                               |                                         |            |                 | 13794/C   | omposite Area A          | <u>, B, C, D)-</u> | 7-1                   |                  |             | Depth/Elev.                                                 |               |                 |             |                 |                    |             |
| Subsample                               |                                         |            | ·               |           | 5                        |                    | <u></u>               |                  |             | Add. Info                                                   |               | _               | CL          | iring Age: 7    | Days               |             |
|                                         |                                         |            |                 | ASTM D 5  | 084; Standa              |                    |                       |                  | -           |                                                             | -             |                 |             | us              |                    | 1           |
| i,                                      | nitial Sar                              | mple Dat   | a (Bàfor        | o Tost)   |                          | sing a Fi          | Test Dat              |                  | eter (iviet | Iethod D, Constant Rate of Flow)<br>Final Data (After Test) |               |                 |             |                 |                    |             |
| Height                                  | iitiai Jai                              | 2.851      | a (Deior<br>]   | 7.24 ci   | n Speed                  |                    | iest Dat              | a<br>7           | 1           |                                                             |               |                 | lilai Dala  | (Allel Te       | 51)                |             |
| Diameter .                              |                                         | 3.019      | lin             | 7.67 ci   |                          | mber               |                       | 7                | · .         | Average Heir                                                | ght of Sample |                 | 2,845       | lin             | 7.23 cm            |             |
| Area                                    |                                         | 7.16       | in ² |           | n ² Cell Nurr | •                  |                       | 12               | 1           |                                                             | meter of Samp |                 | 3.015       |                 | 7.66 cm            |             |
| Volume                                  |                                         | 334.44     | cm ^a | 0.0118 ft |                          | np Number          |                       | 2B               | 1           | Агеа                                                        |               | n ²  | 46.06       | cm ² |                    |             |
| Mass                                    |                                         | 597.70     | а               | 1.32 lb   |                          |                    |                       |                  | cm³/sec     | Volume                                                      |               | 2m ³ | 0.0118      | ft ³ | Dry Density        | 88.2 pcf    |
| Specific Gra                            | avitv                                   | 2.575      | a<br>(Assume    |           | B - Value                |                    |                       | 0.95             | 1           | Mass                                                        | 613.10        | y C             | 1.35        |                 | Vol. of Voids      | 150.22 cm   |
| Dry Density                             | -                                       | 87.6       | pcf             | -,        | Cell Pres                | sure               |                       | 105.0            | psi         |                                                             | ,             | •               |             | ,               | Val. of Solids     | 182.63 cm   |
|                                         |                                         |            | <b>1</b>        |           | Back Pre                 |                    | •                     | 90.0             | psi         |                                                             |               |                 |             |                 | Void Ratio         | 0.82        |
|                                         | Mois                                    | sture Cont | tent            |           | Confining                | a (Effective       | ) Pressure            | 15.0             | psi         |                                                             | Moist         | ure Co          | Intent      |                 | Saturation         | 95.1 %      |
| Mass of wet                             | sample &                                | tare       | 597,70          | la        | Max Hea                  |                    | · .                   | 47.13            | cm          | Mass of wet                                                 | sample & tare |                 | 680.80      | ได              |                    |             |
| Mass of dry                             | sample &                                | tare       | 469.50          | lg        | Min Head                 | t                  |                       | 45.72            | cm          | Mass of dry :                                               | sample & tare |                 | 538.20      | g               |                    |             |
| Mass of tare                            | -                                       |            | 0.00            | g         | Maximun                  | n Gradient         |                       | 6.52             | 1           | Mass of tare                                                | ·             |                 | 68.70       | -<br>g          |                    |             |
| % Moisture                              |                                         |            | 27.3            |           | Minimum                  | Gradient           |                       | 6.33             | 1           | % Moisture                                                  | :             |                 | 30.4        | 1               | · ·                |             |
| TIME                                    | FUNCT                                   | ION        | ∆t              | READING   | Head                     | Gradient           | Temp.                 | PERME            | ABILITY     | (cm/sec)                                                    | 1             | Note: D         | eaired Wate | r Used for      | Permeability Test. |             |
| DATE                                    | HOUR                                    | MIN        | (sec)           | (psi)     | (cm)                     |                    | T _x ( ⁰C ) | @ T _x | RT          | @ 20 °C                                                     |               |                 | DESCRIPT    |                 |                    |             |
| 07/03/12                                | 6                                       | 30         | -               | 0.66      | 46.42                    | 6.42               | 27.0                  | <b>-</b> '       | -           | -                                                           | 1             | A               |             |                 | U                  | SCS         |
| 07/03/12                                | 6                                       | 40         | 600             | 0.65      | 45.72                    | 6.33               | 27.0                  | 6.10E-06         | 0.850       | 5.19E-06                                                    |               |                 |             | •               | (ASTM (            | 02487;2488) |
| 07/03/12                                | 6                                       | 50         | 600             | 0.65      | 45.72                    | 6.33               | 27.0                  | 6.15E-06         | 0.850       | 5.23E-06                                                    | Į [           |                 |             |                 |                    | NA          |
| 07/03/12                                | 7                                       | 0          | 600             | 0.67      | 47.13                    | 6.52               | 27.0                  | 6.06E-06         | 0.850       | 5.15E-06                                                    | ľ –           |                 |             | REMA            | RKS                |             |
| 07/03/12                                | 7                                       | 10         | 600             | 0.65      | 45.72                    | 6.33               | 27.0                  | 6.06E-06         | 0.850       | 5.15E-06                                                    | *             |                 |             |                 |                    |             |
| 07/03/12                                | 7                                       | 20         | 600             | 0.67      | 47.13                    | 6.52               | 27.0                  | 6.06E-06         | 0.850       | 5.15E-06                                                    | *             |                 |             |                 |                    |             |
| 07/03/12                                | 7                                       | 30         | 600             | 0.66      | 46.42                    | 6.42               | 27.0                  | 6.01E-06         | 0.850       | 5.11E-06                                                    | *             |                 |             |                 |                    | -           |
|                                         |                                         |            |                 |           | Reported                 | Average I          | lydraulic Con         | ductivity*       |             | 5.1E-06                                                     | cm/sec        |                 |             |                 |                    |             |
| Flow pump ID # 244 Balance ID # 1/6/7 D |                                         |            |                 |           |                          | Differential F     | Pressure T            | ransducer ID     | #           |                                                             | 263           |                 |             |                 |                    |             |
| Thermomete                              | hermometer ID # 377 Oven ID # 14/15 Boa |            |                 |           |                          | Board Press        | ure Trans             | ducer ID #       |             |                                                             | 215           |                 |             |                 |                    |             |
| Syringe ID #                            | ŧ .                                     | . 24       | 46              | ]         |                          |                    | -                     | Pore Pressu      | ire Transd  | ucer ID #                                                   |               |                 | 28          |                 |                    |             |
|                                         |                                         |            |                 | -         |                          |                    |                       |                  |             |                                                             |               |                 |             | -               |                    |             |

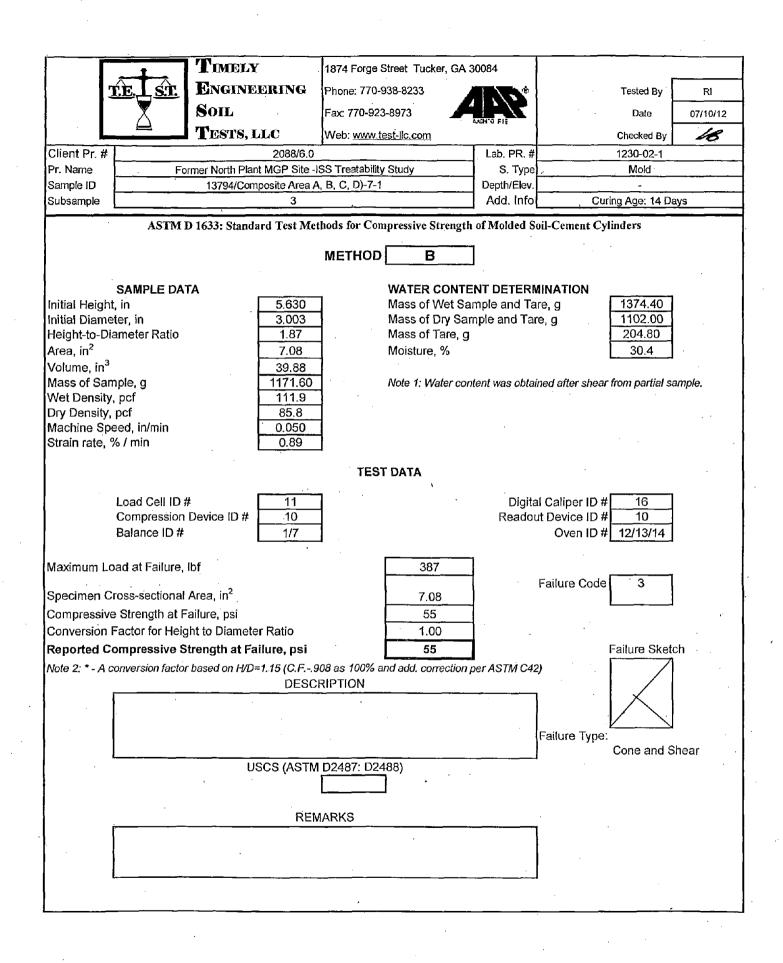
| <u> </u>                    |            |                  |                       |                       |                                       |                   |                     |                  |                      |                             |             |                            |                                   |                                       |                        |
|-----------------------------|------------|------------------|-----------------------|-----------------------|---------------------------------------|-------------------|---------------------|------------------|----------------------|-----------------------------|-------------|----------------------------|-----------------------------------|---------------------------------------|------------------------|
|                             |            | 1                | 3                     | Timei                 | X                                     | 1874 For          | ge Street Tu        | cker, GA 300     | 84                   | ]                           |             |                            |                                   |                                       |                        |
|                             | TE         | <u>L s. </u>     |                       | Engin                 | EERING                                | Phone: 7          | 70-938-8233         |                  | *                    |                             |             |                            |                                   | Tested By                             | EB                     |
|                             |            | $\mathbf{x}^{-}$ |                       | Son                   |                                       | Fax: 770-         | 923-8973            |                  |                      |                             |             |                            |                                   | Date                                  | 07/10/12               |
|                             |            |                  |                       | TESTS                 | .LLC                                  | Web: ww           | w.test-llc.com      | , AAS450         | ) =l¥                | ł                           |             |                            |                                   | Checked By                            | 18                     |
| Client Pr. #                |            |                  |                       |                       | 2088/6:0                              | <u>[</u>          |                     | <u>,</u>         |                      | Lab. PR. #                  | #           | <u>-</u>                   | 1230-02-                          |                                       |                        |
| Pr. Name                    |            |                  | For                   | mer North P           | lant MGP Site -                       | SS Treata         | bility Study        |                  |                      | S. Type                     |             |                            | Mold                              | · · · · · · · · · · · · · · · · · · · | <u> </u>               |
| Sample ID                   |            |                  |                       | 13794/C               | omposite Area /                       | ч, В, С, D)-      | .7-1                |                  |                      | Depth/Elev                  |             |                            | · · ·                             |                                       |                        |
| Subsample                   |            |                  |                       |                       | 6                                     |                   |                     |                  |                      | Add. Info                   | <u></u>     |                            | Curing Age: 14                    | 1 Days                                |                        |
|                             |            |                  |                       | ASTM D                |                                       |                   |                     |                  | -                    |                             | -           |                            | rated Porous                      | · · · ·                               |                        |
|                             |            |                  |                       |                       | Materials U                           | sing a Fl         |                     |                  | eter (Mei            | thod D, Cor                 | istant Rate |                            |                                   |                                       |                        |
|                             | nitial Sa  | mple Dat         | a (Befor              |                       |                                       |                   | Test Dat            | a                | 1                    | 1                           |             | I                          | Final Data (After Tes             | st)                                   |                        |
| Height                      |            |                  | lin<br>I.             |                       | m Speed                               |                   |                     | 7                | - ·                  |                             |             |                            |                                   | <u> </u>                              |                        |
| Diameter                    |            | 3.002            | in<br>in ² | 7.63 C                | m Board Nu<br>m ² Cell Num |                   |                     | 7                |                      | Average Hei                 |             |                            | 2.740 in                          | 6.96 cm                               |                        |
| Area<br>√olume              |            | <u> </u>         | cm ³       | 45.66 ci<br>0.0113 ft |                                       | iber<br>np Number |                     | 12<br>2B         | {                    | Average Dia<br>Area         | 7.13        | npie .<br>Tin ² | 3.012 in<br>45.97 cm ² | 7.65 cm                               |                        |
| Aass :                      |            | 574.40           | a                     | 1.27 lb               | Flow Pur                              | •                 |                     | 1.79E-03         | cm ³ /sec | Volume -                    | 319.93      | cm ³            | 0.0113 ft ³            | Dry Density                           | 87.4 pcf               |
| Specific Gra                | vity       |                  | (Assumed              |                       | B - Value                             |                   |                     | 0.95             | 1                    | Mass                        | 587.10      | 19                         | 1.29 lb                           | Voi. of Voids                         | 145.85 cm ³ |
| Dry Density                 |            | h                | pcf                   | ,                     | Cell Pres                             | sure              |                     | 105.0            | ,<br>psi             | ļ                           |             | <b>.</b>                   | ·                                 | Vol. of Solids                        | 174.08 cm ³ |
|                             |            |                  |                       |                       | Back Pre                              | ssure             | •                   | 90.0             | psi                  |                             |             |                            |                                   | Void Ratio                            | 0.84                   |
|                             |            | sture Cont       | lent                  | •                     | Confining                             | (Effective        | ) Pressure          | 15.0             | psi                  |                             |             | sture Co                   | ontent                            | Saturation                            | 95.2 %                 |
| lass of wet                 | -          |                  | 574.40                | 9                     | Max Hea                               |                   |                     | 70.34            | cm                   | Mass of wet                 | -           |                            | 690.70g                           |                                       |                        |
| Aass of dry<br>Aass of tare | -          | tare             | 447.80                | g                     | Min Hear                              |                   |                     | 68.23            | cm                   | Mass of dry<br>Mass of tare | -           | re                         | 552.00 g                          |                                       |                        |
| 6 Moisture                  |            |                  | 0.00<br>28.3          | g                     |                                       | n Gradient        |                     | 9.80             |                      | % Moisture                  |             |                            | 104.20 g<br>31.0                  |                                       | •                      |
|                             | FUNCT      |                  | $\Delta t$            | READING               | Head                                  | Gradient          | Temp.               |                  |                      | (cm/sec)                    | ·           | Noto: E                    | Deaired Water Used for F          | Pormonbility Tost                     |                        |
| DATE                        | HOUR       |                  | (sec)                 | (psi)                 | (cm)                                  | Gradient          | T _x (°C) | @ T _x |                      | @ 20 °C                     | · `.        | NOIC, L                    | DESCRIPTION                       | enneability rest.                     |                        |
| 07/10/12                    | 7          |                  | (360)                 |                       | 68,93                                 | 9.90              | 27.0                |                  |                      |                             |             | INA                        | DESCRIPTION                       |                                       | scs                    |
| 07/10/12                    | 7          | 10               | -<br>600              | 0.98<br>0.97          | 68.23                                 | 9.90              | 27.0                | -<br>3.96E-06    | 0.850                | 3.36E-06                    | -           |                            |                                   |                                       | 2487;2488)             |
| 07/10/12                    | 7          | 20               | 600                   | 0.97                  | 68.23                                 | 9.80              | 27.0                | 3.98E-06         | 0.850                | 3.38E-06                    | -           |                            |                                   |                                       | VA                     |
| 07/10/12                    | 7          | 30               | 600                   | 0.97                  | 68.93                                 | 9.80              | 27.0                | 3.96E-06         | 0.850                | 3.36E-06                    | *           | ļ                          | REMAR                             | ·                                     | <u> </u>               |
| 07/10/12                    | 7          | 40               | 600                   | 1.00                  | 70.34                                 | 10.11             | 27.0                | 3.90E-06         |                      | 3.31E-06                    | *           | [                          |                                   |                                       |                        |
| 07/10/12                    | 7          | 50               | 600                   | 0.99                  | 69.64                                 | 10.01             | 27.0                | 3.88E-06         |                      | 3.30E-06                    | <b>]</b> *  |                            |                                   |                                       |                        |
| 07/10/12                    | - <u>-</u> | 0                | 600                   | 0.98                  | 68.93                                 | 9.90              | 27.0                | 3.92E-06         |                      |                             | *           |                            |                                   |                                       |                        |
|                             |            | L                |                       |                       |                                       |                   | lydraulic Con       |                  |                      | 3.3E-06                     | cm/sec      | · ·                        |                                   |                                       | J                      |
| ≃low pump i                 | D#         | 24               | 14                    | ,<br>В                | alance ID #                           | 1/6/7             |                     |                  | Pressure T           | ransducer ID                |             |                            | 263                               |                                       |                        |
| Thermomete                  |            | 37               |                       | 1                     | ven ID #                              | 14/15             |                     | Board Press      |                      |                             |             |                            | 215                               |                                       |                        |
| Syringe ID #                |            |                  | 16                    | ĺ                     | - GIT IN N                            | L. 1110           | l                   | Pore Pressu      |                      |                             |             |                            | 28                                |                                       |                        |
| - ,                         |            | <u>_</u>         |                       | 1                     |                                       |                   | •                   | . 910 / 19990    |                      |                             |             |                            |                                   |                                       |                        |
|                             |            |                  |                       |                       |                                       |                   | _                   |                  |                      |                             |             |                            |                                   |                                       |                        |
|                             |            |                  |                       |                       |                                       |                   |                     |                  |                      |                             |             |                            |                                   |                                       |                        |
|                             |            |                  |                       |                       |                                       |                   |                     |                  |                      |                             |             |                            |                                   |                                       |                        |
|                             |            |                  | •                     |                       |                                       |                   |                     |                  |                      |                             |             |                            |                                   |                                       |                        |

|                        |            |                  |                        | TIMEL                 | X                    | 1874 Eop           | ne Street Tur                     | cker, GA 3008    | <u></u>              | <u> </u>                 |                                                                                                                                                                                                |
|------------------------|------------|------------------|------------------------|-----------------------|----------------------|--------------------|-----------------------------------|------------------|----------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |            |                  |                        |                       | IEERING              |                    | -                                 |                  |                      |                          |                                                                                                                                                                                                |
|                        | TE         | <u>st</u>        |                        |                       | - EQUICING           |                    | 70-938-8233                       |                  |                      |                          | Tested By EB                                                                                                                                                                                   |
|                        |            | X                |                        | Soll                  |                      | Fax: 770-          | 923-8973                          |                  | - 1¥                 |                          | Date 07/24/12                                                                                                                                                                                  |
|                        | <u> </u>   |                  |                        | TESTS,                | , LLC                | Web: <u>ww</u>     | w.test-jlc.com                    |                  |                      | · ·                      | Checked By                                                                                                                                                                                     |
| Client Pr. #           |            |                  |                        |                       | 2088/6.0             |                    |                                   |                  |                      | Lab. PR. #               |                                                                                                                                                                                                |
| Pr. Name               |            |                  | For                    |                       | lant MGP Site -I     |                    |                                   |                  |                      | S. Type                  | Mold                                                                                                                                                                                           |
| Sample ID<br>Subsample | ·          |                  |                        | 13794/Ci              | omposite Area A<br>7 | <u>, В, С, D)-</u> | -7-1                              |                  |                      | Depth/Elev.<br>Add. Info | Curing Age: 28 Days                                                                                                                                                                            |
| Subsample              |            |                  |                        |                       |                      |                    |                                   |                  |                      | 1                        |                                                                                                                                                                                                |
|                        |            |                  |                        | ASTM D (              | •                    |                    |                                   |                  | -                    |                          | ductivity of Saturated Porous                                                                                                                                                                  |
|                        |            |                  |                        |                       | Materials U          | sing a Fi          |                                   |                  | eter (Met            | noa D, Cons              | stant Rate of Flow)                                                                                                                                                                            |
| 1                      | nitial Sar | npie Dat         |                        |                       |                      |                    | Test Dat                          |                  | 1                    |                          | Final Data (After Test)                                                                                                                                                                        |
| Height                 |            | 2.812            |                        |                       | m Speed              |                    |                                   | 8                |                      |                          |                                                                                                                                                                                                |
| Diameter               |            | 3.006            | in<br>in ²  | 7.64 CI               | <u>`</u>             |                    |                                   | 8                |                      | 4                        | ght of Sample 2.810 in 7.14 cm                                                                                                                                                                 |
| Area                   |            |                  | เก-<br>cm ³ | 45.79 ci<br>0.0115 ft |                      |                    |                                   | 19<br>2B         | ·                    | _                        | meter of Sample 3.002 in 7.63 cm                                                                                                                                                               |
| Volume                 | · .        | 327.03<br>582.40 |                        | 1.28 lb               |                      | np Number          | ſ                                 | 2B<br>8.96E-04   | cm ³ /sec | Area .<br>Volume         |                                                                                                                                                                                                |
| Mass<br>Specific Gra   | wity       |                  | g<br>(Assume)          |                       | B - Value            | •                  |                                   | 0.95             | 1011/300             | Mass                     | 325.93         cm³         0.0115         ft³         Dry Density         87.3         pcf           599.00         g         1.32         lb         Vol. of Voids         148.89         cm³ |
| Dry Density            | -          |                  | pcf                    | <i>,</i>              | Cell Pres            |                    |                                   | 105.0            | psi                  | 111111111                | Vol. of Solids   177.03 cm ³                                                                                                                                                        |
| Dry Denony             |            |                  | [boi                   |                       | Back Pre             |                    |                                   | 90.0             | psi                  |                          | Void Ratio 0.84                                                                                                                                                                                |
| 1                      | Mois       | ture Conf        | ent                    |                       |                      |                    | e) Pressure                       | 15.0             | psi                  |                          | Moisture Content Saturation 96.1 %                                                                                                                                                             |
| Mass of wet            | sample &   | tare             | 582.40                 | g                     | Max Hea              |                    | •                                 | 59,09            | cm                   | Mass of wet              | sample & tare 692.40 g                                                                                                                                                                         |
| Mass of dry            | sample &   | tare             | 455.10                 | g                     | Min Heat             | 1                  |                                   | 58.38            | cm                   | Mass of dry s            | sample & tare 549.50 g                                                                                                                                                                         |
| Mass of tare           | 9          |                  | 0.00                   | g.                    | Maximum              | n Gradient         |                                   | 8.28             | ]                    | Mass of tare             | 94.40 g                                                                                                                                                                                        |
| % Moisture             |            |                  | 28.0                   |                       | Minimum              | Gradient           |                                   | 8.18             |                      | % Moisture               | 31.4                                                                                                                                                                                           |
| TIME                   | FUNCT      | ON               | Δt                     | READING               | Head                 | Gradient           | - Temp.                           | PERME            | ABILITY              | (cm/sec)                 | Note: Deaired Water Used for Permeability Test.                                                                                                                                                |
| DATE                   | HOUR       | MIN              | (sec)                  | (psi)                 | (cm)                 |                    | T _x ( ^o C ) | @ T _x | R _T       | @ 20 °C                  | DESCRIPTION                                                                                                                                                                                    |
| 07/24/12               | 7          | 0                | -                      | 0.84                  | 59.09                | 8.28               | 27.0                              |                  |                      | -                        | NA USCS                                                                                                                                                                                        |
| 07/24/12               | 7          | 10               | 600                    | 0.83                  | 58.38                | 8.18               | 27.0                              | 2.38E-06         | 0.850                | 2.03E-06                 | (ASTM D2487;2488)                                                                                                                                                                              |
| 07/24/12               | 7          | 20               | 600                    | 0,83                  | 58.38                | 8.18               | 27.0                              | 2.40E-06         | 0.850                | 2.04E-06                 | NA                                                                                                                                                                                             |
| 07/24/12               | 7          | 30               | 600                    | 0.84                  | 59.09                | 8.28               | 27.0                              | 2.38E-06         | 0.850                | 2.03E-06                 | * REMARKS                                                                                                                                                                                      |
| 07/24/12               | 7          | 40               | 600                    | 0.84                  | 59.09                | 8.28               | 27.0                              | 2.37E-06         | 0,850                | 2.02E-06                 | <b>*</b>                                                                                                                                                                                       |
| 07/24/12               | 7          | 50               | 600                    | 0,84                  | 59.09                | 8.28               | 27.0                              | 2.37E-06         | 0.850                | 2.02E-06                 | *                                                                                                                                                                                              |
| 07/24/12               | 8          | 0                | 600                    | 0.84                  | 59.09                | 8.28               | 27.0                              | 2.37E-06         | 0.850                | 2.02E-06                 | *                                                                                                                                                                                              |
| · ·                    |            |                  |                        |                       | Reported             | Average H          | lydraulic Con                     | ductivity*       |                      | 2.0E-06                  | cm/sec                                                                                                                                                                                         |
| Flow pump              | ID#        | .24              | 44                     | јв                    | alance ID #          | 1/6/7              | ]                                 | Differential P   | Pressure T           | ransducer ID ;           | #263                                                                                                                                                                                           |
| Thermometer            | er ID #    | 3                | 77                     | ] c                   | )ven ID #            | 14/15              | ] .                               | Board Press      | ure Trans            | ducer ID #               | 215                                                                                                                                                                                            |
| Syringe ID #           |            | _                | 10                     | 1                     |                      |                    | - ,                               |                  |                      |                          |                                                                                                                                                                                                |
| loyiniye iD r          | <b>F</b>   | 24               | <b>1</b> 6             | 1                     |                      |                    |                                   | Pore Pressu      | ire Transd           | ucer ID #                | 28                                                                                                                                                                                             |

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|                          |                    |                       |                                       |                                          |                            | •         |
|--------------------------|--------------------|-----------------------|---------------------------------------|------------------------------------------|----------------------------|-----------|
|                          |                    |                       |                                       |                                          |                            |           |
|                          | •                  | TIMELY                | 1874 Forge Street Tucke               | r, GA 30084                              |                            | ]         |
|                          | <u>TE ST</u>       | ENGINEERIN            | _                                     |                                          | Tested By                  | RI        |
|                          |                    | Soil                  | Fax: 770-923-8973                     | AR                                       | Date                       | 07/03/12  |
|                          | $\Box$             | TESTS, LLC            | Web: <u>www.test-lic.com</u>          |                                          | Checked By                 | 18        |
| Client Pr.               | #                  |                       | 8/6.0                                 | Lab. PR. #                               | 1230-02-1                  |           |
| Pr. Name                 | Fo                 |                       | Site -ISS Treatability Study          | S. Type                                  | Mold                       |           |
| Sample ID<br>Subsample   | ļ                  |                       | Area A, B, C, D)-7-12                 | Depth/Elev.<br>Add. Info                 | Curing Age: 7 Da           |           |
| Subsample                |                    |                       |                                       |                                          |                            | <u>ys</u> |
|                          | ASTM               | D 1633: Standard Tes  | t Methods for Compressive St          | rength of Molded Soil-C                  | Cement Cylinders           |           |
|                          |                    |                       | METHOD B                              |                                          |                            |           |
|                          |                    |                       | <u>.</u>                              |                                          | -                          |           |
| nitial Heig              | SAMPLE DA          | TA                    |                                       | ONTENT DETERMIN/<br>Vet Sample and Tare, |                            |           |
| Initial Diar             |                    | 3.0                   |                                       | ry Sample and Tare, g                    |                            |           |
|                          | Diameter Ratio     | 1.8                   |                                       |                                          | 261.20                     |           |
| Area, in ²    |                    | 7.1                   |                                       | -                                        | 30.8                       |           |
| Volume, ir               | n ³     | . 39.                 |                                       |                                          |                            | 1         |
| Mass of S                |                    | 1163                  | 3.60 Note 1: Wa                       | ter content was obtained                 | after shear from partial s | ample.    |
| Wet Dens                 |                    | 11(                   |                                       |                                          |                            | 1         |
| Dry Densi                |                    |                       | .7                                    |                                          |                            | [         |
| Machine &<br>Strain rate | Speed, in/min      | 0.0                   |                                       |                                          |                            | ł         |
| Juannate                 | 5, 707 11111       |                       | <u></u>                               | 2                                        |                            |           |
|                          |                    |                       | TEST DATA                             |                                          | ·.                         |           |
|                          | Load Cell ID       | # 1                   | 1                                     | Digital Ca                               | aliper ID # 16             |           |
|                          | Compression        |                       | 0                                     | Readout D                                |                            |           |
|                          | Balance ID #       | 1/                    | 17                                    |                                          | Oven ID # 12/13/14         |           |
|                          |                    |                       |                                       |                                          |                            |           |
| Maximum                  | Load at Failure,   | lbf                   | 317                                   |                                          |                            | , í       |
| Specimen                 | Cross-sectional    | Area in ²  | 7.11                                  |                                          | lure Code 3                |           |
| •                        | sive Strength at F | -                     | 45                                    | <u> </u>                                 | · ·                        |           |
| •                        | -                  | ght to Diameter Ratio | · · · · · · · · · · · · · · · · · · · | <u></u>                                  |                            |           |
|                          |                    | Strength at Failure,  |                                       |                                          | Failure Sket               | rch.      |
| •                        | •                  | •                     | C.F,908 as 100% and add. corr         |                                          |                            |           |
| VULUE 2 1                | A conversion lacto |                       | ESCRIPTION                            | eculor per ASTM 642)                     |                            |           |
| •                        | [                  |                       |                                       | <u> </u>                                 |                            |           |
|                          |                    |                       |                                       | •                                        |                            |           |
|                          |                    |                       |                                       | Fai                                      | lure Type:                 |           |
|                          |                    |                       |                                       |                                          | Cone and S                 | Shear     |
|                          | <b></b>            | USCS (A               | ASTM D2487: D2488)                    |                                          |                            |           |
|                          |                    |                       |                                       |                                          |                            |           |
|                          |                    |                       |                                       |                                          |                            |           |
|                          |                    |                       | REMARKS                               |                                          |                            | 2         |
|                          | !                  |                       |                                       |                                          |                            | ,         |
|                          |                    |                       |                                       |                                          |                            |           |
|                          |                    |                       |                                       | ľ                                        |                            |           |
|                          |                    |                       |                                       |                                          |                            | Į         |

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| [                                      |                               | TIMELY                     |                              |                                   | - <u></u>                               |            |
|----------------------------------------|-------------------------------|----------------------------|------------------------------|-----------------------------------|-----------------------------------------|------------|
|                                        | Ê. ST.                        | Engineering                | 1874 Forge Street Tucker     | , GA 30084                        |                                         |            |
|                                        |                               | Soil                       | Phone: 770-938-8233          |                                   | Tested By                               | RI         |
|                                        | $\triangle$                   |                            | Fax: 770-923-8973            | AJEN"O FIS                        | Date                                    | 07/24/12   |
| Client Pr. #                           |                               | <b>TESTS, LLC</b> 2088/6.0 | Web: <u>www.test-llc.com</u> | Lab. PR. #                        | Checked By                              | 18         |
| Pr. Name                               | For                           | mer North Plant MGP Site - | ISS Treatability Study       | Lab. PR. #                        | 1230-02-1<br>Mold                       |            |
| Sample ID                              |                               | 13794/Composite Area /     |                              | Depth/Elev.                       |                                         |            |
| Subsample                              |                               | 4                          |                              | Add. Info                         | Curing Age: 28 D                        | ays        |
|                                        | ASTM D                        | 1633: Standard Test Me     | thods for Compressive Str    | rength of Molded S                | oil-Cement Cylinders                    |            |
|                                        |                               | *                          | METHOD B                     |                                   |                                         |            |
|                                        |                               |                            |                              |                                   |                                         |            |
| Initial Height                         | SAMPLE DAT                    | A 5.677                    |                              | ONTENT DETERN<br>et Sample and Ta |                                         |            |
| Initial Diame                          |                               | 3.011                      |                              | ry Sample and Ta                  |                                         |            |
| Height-to-Dia                          |                               | 1.89                       | Mass of Ta                   | are, g                            | 207.10                                  |            |
| Area, in ²                  |                               | 7.12                       | Moisture, '                  | %                                 | 29.4                                    | 1          |
| Volume, in ³<br>Mass of Sam | nple, a                       | <u>40.42</u><br>1168.80    | Note 1: Wat                  | er content was obla               | ined after shear from partial s         | ample.     |
| Wet Density,                           | pcf                           | . 110.1                    |                              |                                   | ·····                                   |            |
| Dry Density,<br>Machine Spe            |                               | 85.1<br>0.050              | -1                           |                                   |                                         |            |
| Strain rate, 9                         |                               | 0.88                       | -                            |                                   |                                         |            |
|                                        |                               |                            | TEST DATA                    |                                   |                                         |            |
|                                        |                               |                            | TEST DATA                    |                                   |                                         |            |
|                                        | Load Cell ID #                |                            | ]                            |                                   | al Caliper ID # 16                      |            |
|                                        | Compression I<br>Balance ID # | Device ID # 10<br>1/7      |                              | Reador                            | ut Device ID # 10<br>Oven ID # 12/13/14 |            |
| 1                                      | Dalance 10 #                  |                            | J ,                          |                                   |                                         | 1.         |
| Maximum Lo                             | oad at Failure, I             | ibf                        | 480                          | ·                                 |                                         |            |
| Specimen C                             | ross-sectional                | Area in ²       | 7.12                         |                                   | Failure Code 3.                         |            |
| 1.                                     | e Strength at Fa              |                            | 67                           |                                   | L                                       | <b>J</b> . |
| 1 · ·                                  | -                             | ht to Diameter Ratio       | 1.00                         |                                   |                                         |            |
|                                        |                               | trength at Failure, psi    | 67                           |                                   | Failure Skel                            | tch        |
| Note 2: * - A c                        | conversion factor             | based on H/D=1.15 (C.F     | · · ·                        | ection per ASTM C4                | 2)                                      |            |
|                                        |                               |                            | RIPTION                      |                                   | 1 🖌                                     |            |
|                                        |                               |                            |                              |                                   |                                         |            |
|                                        |                               |                            |                              |                                   | Failure Type:                           |            |
|                                        |                               |                            | 1 D2487: D2488)              | ·                                 | Cone and S                              | Shear      |
|                                        |                               | 1000 (101)                 | 1 D2407, D2400)              |                                   | ·                                       |            |
|                                        |                               |                            |                              |                                   |                                         |            |
|                                        |                               | REI                        | MARKS                        | ,                                 | <b>,</b>                                |            |
|                                        |                               |                            |                              |                                   |                                         |            |
|                                        |                               |                            |                              |                                   | · ·                                     |            |
|                                        | L                             |                            |                              | · <u> </u>                        | 1                                       |            |
| ļ                                      |                               |                            | <u></u>                      |                                   | · · · · · · · · · · · · · · · · · · ·   |            |
|                                        | ,                             |                            |                              |                                   |                                         |            |
|                                        |                               |                            |                              |                                   |                                         |            |

|              | -          | t                                            | Í                | TIMEI        | X                       | 1874 For             | ge Street Tu                   | cker, GA 3008        | 34                                    |                               |             |          |                 |                 |                  |                        |
|--------------|------------|----------------------------------------------|------------------|--------------|-------------------------|----------------------|--------------------------------|----------------------|---------------------------------------|-------------------------------|-------------|----------|-----------------|-----------------|------------------|------------------------|
|              | T.E.       | Isr.                                         |                  | ENGIN        | EERING                  | Phone: 77            | 70-938-8233                    |                      |                                       |                               |             |          |                 |                 | Tested By        | EB                     |
| [            |            |                                              |                  | Soll         | ,                       | Fax: 770-            | 923-8973                       |                      |                                       |                               |             |          |                 |                 | Date             | 07/27/12               |
| [ .          |            |                                              |                  | TESTS        | LLC                     | Web: www             | w.test-lic.com                 |                      | *17                                   |                               |             |          |                 |                 | Checked By       | 18                     |
| Client Pr. # |            |                                              |                  |              | 2088/6.0                | ,                    | ·                              | ·                    |                                       | Lab. PR. #                    |             |          |                 | 1230-02-1       |                  |                        |
| Pr. Name     |            |                                              | Foi              |              | ant MGP Site -I         |                      |                                |                      |                                       | S. Type                       |             |          |                 | Mold            |                  |                        |
| Sample ID    |            |                                              |                  | 13794/C      | omposite Area A         | . В <b>, С, D)</b> - | 8-1                            |                      |                                       | Depth/Elev.                   | ·           |          |                 |                 |                  |                        |
| Subsample    | ·          | <u>.                                    </u> |                  |              | 7                       |                      |                                |                      |                                       | Add. Info                     | L           |          | Curi            | ng Age: 29 D    | )ays             |                        |
|              |            |                                              |                  | ASTM D       | 5084; Standar           | d Test M             | lethod for I                   | Measureme            | nt of Hy                              | draulic Con                   | ductivity   | of Satu  | irated Porou    | IS              |                  |                        |
|              |            |                                              |                  |              | Materials U             | sing a Fl            | exible Wall                    | Permeame             | eter (Met                             | hod D, Con                    | stant Rate  | e of Flo | w)              |                 |                  |                        |
| iı           | nitial Sar | mple Dat                                     | a (Befor         | e Test)      |                         |                      | Test Dat                       | a                    |                                       |                               |             |          | Final Data (    | After Test)     | )                |                        |
| Height       |            | 2.909                                        | in ⁽  | 7.39 c       | m Speed                 |                      |                                | 13                   | ]                                     |                               |             |          |                 |                 |                  |                        |
| Diameter     |            | 3.015                                        | ]in              | 1            | m Board Nu              | imber                |                                | · 9                  | ]                                     | Average Hei                   | ght of Samp | le '     | 2.901           | in              | 7.37 cm          |                        |
| Area         |            |                                              | ]in ² |              | m ² Cell Num | ber                  |                                | 9                    |                                       | Average Dia                   | meter of Sa |          |                 | in              | 7.61 cm          |                        |
| Volume       |            | 340.34                                       | cm ³  | 0.0120 ft    | ³ Flow Purr  | np Number            |                                | 2A                   |                                       | Area                          | 7.06        | in²      |                 | cm ² |                  |                        |
| Mass         |            | 603.50                                       | 9                | 1.33 lt      |                         | *                    |                                | 2.80E-05             | cm³/sec                               | Volume                        | 385.58      | cm³      | 0.0119          | ft ³ | Dry Density      | 87.9 pcf               |
| Specific Gra | avity      |                                              | (Assume          | d) ·         | B - Value               |                      |                                | 0.95                 |                                       | Mass                          | 617.20      | g        | 1.36            | lb              | Vol. of Voids    | 151.99 cm              |
| Dry Density  |            | 86.5                                         | pcf              |              | Cell Pres               |                      |                                | 105.0                | psi                                   |                               |             |          |                 |                 | Vol. of Solids   | 183.59 cm ³ |
| Î            |            |                                              |                  |              | Back Pre                |                      |                                | 90.0                 | psi                                   |                               |             |          |                 |                 | Void Ratio       | 0.83                   |
|              |            | sture Con                                    |                  | 7            | -                       |                      | ) Pressure                     | 15.0                 | psi                                   |                               |             | sture C  |                 |                 | Saturation       | 95,0 %                 |
| Mass of we   |            |                                              | 603.50           | 1            | Max Head                |                      |                                | 189.92               | cm                                    | Mass of wet                   | •           |          | 711.80          | g               |                  | -                      |
| Mass of dry  | •          | tare                                         | 471.60<br>0.00   | g            | Min Head                | i<br>Gradient        |                                | 189.21<br>25.77      | cm                                    | Mass of dry a<br>Mass of tare | •           | re       | 567.70<br>96.10 | g               |                  |                        |
| Mass of tare | ;          |                                              |                  | <b>a</b>     | Minimum                 |                      |                                | 25.68                | Į                                     | % Moisture                    | · · · ·     |          | 30.6            | y               |                  |                        |
| % Moisture   | - FUNOT    |                                              | 28.0<br>         |              |                         |                      | Tama                           |                      |                                       | (cm/sec)                      | ·····       |          |                 | the set from Do |                  |                        |
|              | FUNCT      |                                              |                  | READING      | Head                    | Gradient             | Temp.<br>T _x ( °C ) |                      | · · · · · · · · · · · · · · · · · · · | (cm/sec)<br>@ 20 °C           | 1           | Note: 1  |                 |                 | rmeability Test. |                        |
| DATE         | HOUR       | MIN                                          | (sec)            | (psi)        | (cm)                    | 05 77                |                                | @ T _x     | RT                                    | 0200                          | -           | NA       | DESCRIPTI       | <u>UN</u>       | 1.               | ·                      |
| 07/27/12     | 10         | 0                                            | -                | 2.70         | 189.92                  | 25.77                | 27.0                           | -<br>2.39E-08        | -                                     |                               | 1           | [        |                 |                 | 1                | ISCS<br>D2487;2488)    |
| 07/27/12     | 10         | 10                                           | 600              | 2.69         | 189.21                  | 25.68                | 27.0                           |                      | 0.850                                 | 2.03E-08                      | 1           | 1        |                 |                 | Ì                |                        |
| 07/27/12     | 10         | 20                                           | 600              | 2.69         | 189,21                  | 25.68                | 27.0                           | 2.39E-08             | 0.850                                 | 2.04E-08                      | •           |          |                 |                 |                  | NA .                   |
| 07/27/12     | 10<br>10   | 30                                           | 600              | 2.70         | 189.92                  | 25.77                | 27.0                           | 2.39E-08             | 0.850                                 | 2.03E-08                      | <b>.</b>    | F        | <u> </u>        | REMARK          | 5                |                        |
| 07/27/12     |            | 40                                           | 600              | 2.69<br>2.70 | 189.21                  | 25.68<br>25.77       | 27.0                           | 2.39E-08<br>2.39E-08 | 0.850                                 | 2.03E-08                      | ·           | [        |                 |                 |                  |                        |
| 07/27/12     | 10         | 50                                           | 600              |              | 189.92                  | 25.77                | 27.0                           | 2.39E-08             | 0.850                                 | 2.03E-08                      | ł.          |          |                 |                 |                  |                        |
| 07/27/12     | 11         | 0                                            | 600              | 2.70         | 189.92                  |                      | 27.0                           |                      | 0,850                                 | 2.03E-08                      | 4           | L        |                 |                 | ·                |                        |
|              | <b>.</b>   |                                              |                  |              | -                       |                      | lydraulic Con<br>I             |                      | . –                                   | 2.0E-08                       | cm/sec      |          |                 |                 |                  |                        |
| Flow pump    |            | }                                            | 44               | - ·          | alance ID #             | 1/6/7                |                                |                      |                                       | ransducer ID                  | #           |          | 262             |                 |                  |                        |
| Thermomet    |            |                                              | 77               | 0            | ven ID #                | 14/15                | l                              | Board Press          |                                       |                               |             |          | 216             | . •             |                  |                        |
| Syringe ID # | <b>#</b>   | 2                                            | 45               | ]            |                         |                      |                                | Pore Pressu          | re Transd                             | ucer ID #                     |             |          | 28              | •               |                  |                        |
|              |            |                                              |                  |              |                         |                      |                                |                      |                                       |                               |             | ł        |                 |                 |                  |                        |

|                                                  |                                           |                                       | 1874 Forge Street Tucker, G            | A 30084                              | · · · ·                         |          |
|--------------------------------------------------|-------------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|---------------------------------|----------|
| 4                                                |                                           | TERING                                | Phone: 770-938-8233                    |                                      | Tested By                       | RI       |
|                                                  | <b>Soll</b>                               |                                       | Fax: 770-923-8973                      | AUSHTO RIE                           | Date                            | 07/27/12 |
|                                                  | TESTS,                                    |                                       | Web: <u>www.test-llc.com</u>           |                                      | Checked By                      | 18       |
| Client Pr. #<br>Pr. Name                         | Former North P                            | 2088/6.0                              | SS Treatability Study                  | Lab. PR. #                           | <u>1230-02-1</u><br>Mold        | ,        |
| Sample ID                                        |                                           | omposite Area A                       |                                        | Depth/Elev                           |                                 |          |
| Subsample                                        | Ĺ                                         | 4                                     | ······································ | Add. Info                            | Curing Age: 29 D                | ays      |
| · ·                                              | ASTM D 1633: Star                         | ndard Test Met                        | hods for Compressive Streng            | gth of Molded Soil-C                 | ement Cylinders                 |          |
|                                                  |                                           |                                       | METHOD B                               | 7                                    |                                 |          |
|                                                  |                                           |                                       |                                        | <br>                                 |                                 |          |
| Initial Height                                   | SAMPLE DATA                               | 5.602                                 | -                                      | TENT DETERMINA<br>Sample and Tare, g |                                 |          |
| Initial Diame                                    |                                           | 3.012                                 | Mass of Dry S                          | Sample and Tare, g                   | 1221.40                         |          |
|                                                  | ameter Ratio                              | 1.86                                  | Mass of Tare,                          | 9                                    | 331.80                          |          |
| Area, in ²<br>Volume, in ³ |                                           | 7.13                                  | Moisture, %                            |                                      | 29.5                            | l .      |
| Mass of Sar                                      |                                           | 1156.60                               | Note 1: Water of                       | content was obtained                 | after shear from partial s      | ample.   |
| Wet Density                                      |                                           | 110,4                                 | -                                      |                                      |                                 |          |
| Dry Density,<br>Machine Sp                       |                                           | <u>85.2</u><br>0.050                  | 4                                      |                                      | -                               |          |
| Strain rate,                                     |                                           | 0.89                                  | 1                                      |                                      |                                 |          |
|                                                  |                                           |                                       | TEST DATA                              |                                      |                                 |          |
|                                                  |                                           | · · · · · · · · · · · · · · · · · · · | 7                                      |                                      |                                 |          |
|                                                  | Load Cell ID #<br>Compression Device ID # | # <u>11</u><br># 10                   | -                                      | Digital Ca<br>Readout De             | aliper ID # 16<br>evice ID # 10 |          |
|                                                  | Balance ID #                              | 1/7                                   |                                        |                                      | Oven ID # 12/13/14              |          |
|                                                  |                                           | · · ·                                 | -                                      | —                                    |                                 | •        |
| Maximum Lo                                       | oad at Failure, lbf                       |                                       | 1691                                   |                                      | lure Code 3                     | 1        |
| Specimen C                                       | cross-sectional Area, in ²     |                                       | 7.13                                   |                                      |                                 |          |
|                                                  | e Strength at Failure, psi                |                                       | 237                                    |                                      |                                 |          |
|                                                  | Factor for Height to Diame                |                                       | 1.00<br>237                            |                                      | Failura Chai                    | ab       |
|                                                  | ompressive Strength at                    |                                       | 231<br>008 as 100% and add. correction | on per ASTM (242)                    | Failure Skel                    | ]        |
| 11046 Z, - A                                     |                                           |                                       | RIPTION                                |                                      |                                 | 1        |
|                                                  |                                           |                                       | · · ·                                  |                                      |                                 | 1.       |
|                                                  |                                           |                                       |                                        |                                      |                                 | 1        |
|                                                  |                                           |                                       |                                        | Fai                                  | lure Type:<br>Cone and S        | Shear    |
| ļ                                                | · · · · · · · · · · · · · · · · · · ·     | USCS (ASTM                            | D2487: D2488)                          |                                      |                                 |          |
|                                                  |                                           |                                       |                                        |                                      |                                 |          |
|                                                  |                                           | RFN                                   | MARKS                                  |                                      |                                 |          |
| · ·                                              |                                           |                                       | ······································ |                                      |                                 |          |
|                                                  |                                           |                                       |                                        |                                      |                                 | ,        |
| 1                                                | ·                                         |                                       |                                        |                                      |                                 |          |
|                                                  |                                           |                                       |                                        |                                      |                                 |          |
|                                                  |                                           |                                       |                                        |                                      |                                 |          |
|                                                  |                                           |                                       | <u>`</u>                               |                                      | · · ·                           |          |

|                                       |                  | TIMELY                 |                        | 1874 Ford     | e Street Tu           |                  |                      | [                    | · · · · · · · · · · · · · · · · · · · | <u></u>                               | · <u>·</u>                      | <u> </u>                                         |
|---------------------------------------|------------------|------------------------|------------------------|---------------|-----------------------|------------------|----------------------|----------------------|---------------------------------------|---------------------------------------|---------------------------------|--------------------------------------------------|
| TE ST.                                |                  | ENGINE                 |                        | ÷.            | 0-938-8233            |                  |                      |                      |                                       |                                       | Tested By                       | EB                                               |
|                                       |                  | Soll                   |                        | Fax: 770-     |                       | A                |                      | {                    |                                       |                                       | Date                            | 07/05/12                                         |
| $\Delta$                              |                  | TESTS, 1               | TC                     |               | v.test-llc.com        | - 10070          | न हि                 |                      |                                       |                                       | Checked By                      | 18                                               |
| Client Pr. #                          | -<br>            |                        | 2088/6.0               | 1             |                       |                  |                      | Lab. PR.             | #                                     | 1230-                                 |                                 |                                                  |
| Pr. Name                              | Form             | her North Plan         |                        |               |                       |                  |                      | S. Typ               |                                       | Mol                                   | ld                              |                                                  |
| Sample IDSubsample                    |                  | 13/94/Con              | posite Area A<br>5     | а, в, с, р)-  | <del>9-</del> 1       | · · · · ·        | <b>-</b> • • • •     | Depth/Ele<br>Ádd, In |                                       | Curing Age                            | e: 7 Davs                       | · · · · ·                                        |
|                                       |                  | ASTM D 50              |                        | rd Test M     | ethod for l           | Measureme        | nt of Hy             |                      | onductivity of Sat                    | · · · · · · · · · · · · · · · · · · · |                                 |                                                  |
|                                       |                  |                        |                        |               |                       |                  | -                    |                      | instant Rate of Fl                    |                                       |                                 |                                                  |
| Initial Sample Dat                    | ta (Before       |                        |                        |               | Test Dat              |                  |                      |                      |                                       | Final Data (After                     | Test)                           |                                                  |
| Height 2.748                          | ]in [            | 6.98 cm                | Speed                  |               |                       | 12               | !                    |                      |                                       |                                       |                                 |                                                  |
| Diameter 3.007                        | in               | 7.64 cm                | Board Nu               |               |                       | 7                |                      | Average H            | eight of Sample                       | 2.745 in                              | 6.97 cm                         |                                                  |
| Area 7.10                             | lin ² | 45.82 cm ²  | Cell Nurr              |               |                       | 10               |                      |                      | iameter of Sample                     | 3.002 in                              | 7.63 cm                         |                                                  |
| Volume 319.80                         | cm° i            | 0.0113 ft ³ |                        | np Number     |                       | 2B               |                      | Area                 | 7.08 in ²                  | 45.66 cm ²                 | г                               |                                                  |
| Mass 578.80                           | a L              | 1.28 lb                | Flow Pur               |               |                       | 5.60E-05         | cm ³ /sec | Volume               | 318.39 cm ³                | 0.0112 ft ³                | Dry Density                     | 89.4 pcf                                         |
| · · · · · · · · · · · · · · · · · · · | (Assumed)        |                        | B - Value<br>Cell Pres |               |                       | 0.95             | psi                  | Mass                 | <u>593.50</u> 9                       | 1.31 lb                               | Val. of Vaids<br>Vol. of Solids | 141.18 cm ³<br>177.21 cm ³ |
|                                       | Ibei             |                        | Back Pre               |               |                       |                  | psi                  |                      |                                       |                                       | Void Ratio                      | 0.80                                             |
| Moisture Con                          | tent             |                        | 1                      | g (Effective) | Pressure              |                  | psi                  | ] .                  | Moisture C                            | ontent                                | Saturation                      | 97.2 %                                           |
| Mass of wet sample & tare             | 578.80           | 3                      | Max Hea                |               |                       | 80.89            | cm                   | Mass of we           | et sample & tare                      | 709.30 g                              | L                               |                                                  |
| Mass of dry sample & tare             | 455.70           | 9                      | Min Head               | 4             |                       | 80.19            | cm                   | Mass of dr           | y sample & tare                       | 572.30 g                              | •                               |                                                  |
| Mass of tare                          | 0.00             | 3                      |                        | n Gradient    |                       | 11.60            |                      | Mass of tar          | e .                                   | 116.60 g                              |                                 |                                                  |
| % Moisture                            | 27.0             |                        |                        | Gradient      |                       | 11.50            |                      | % Moisture           |                                       | 30.1                                  |                                 |                                                  |
| TIME FUNCTION                         | ∆t               | READING                | Head                   | Gradient      | Temp.                 |                  | · · · · · ·          | (cm/sec)             |                                       | Deaired Water Used f                  | or Permeability Test.           |                                                  |
| DATE HOUR MIN                         | (sec)            | (psi)                  | (cm)                   | 44.00         | T _x ( °C ) | @ T _x | RT                   | @ 20 °C              |                                       | DESCRIPTION                           | ·                               |                                                  |
| 07/05/12 7 0<br>07/05/12 7 10         |                  | 1.15<br>1.14           | 80.89<br>80.19         | 11.60         | 27.0<br>27.0          | -<br>1.06E-07    | - 0.850              | 9.03E-08             |                                       |                                       |                                 | SCS<br>)2487;2488)                               |
| 07/05/12 7 10<br>07/05/12 7 20        | 600<br>600       | 1.14                   | 80.19                  | 11.50         | 27.0                  | 1.07E-07         | 0.850                | 9.03E-00             |                                       |                                       | ·                               | VA                                               |
| 07/05/12 7 30                         | 600              | 1.15                   | 80.89                  | 11.60         | 27.0                  | 1.06E-07         | 0.850                | 9.03E-08             |                                       |                                       | ' <b></b> _'<br>MARKS           |                                                  |
| 07/05/12 7 40                         | 600              | 1.14                   | 80.19                  | 11.50         | 27.0                  | 1.06E-07         | 0.850                | 9.03E-08             |                                       |                                       |                                 |                                                  |
| 07/05/12 7 50                         | 600              | 1.14                   | 80.19                  | 11.50         | 27.0                  | 1.07E-07         | 0.850                | 9.07E-08             |                                       |                                       | •                               |                                                  |
| 07/05/12 8 0                          | 600              | 1.15                   | 80,89                  | 11.60         | 27.0                  | 1.06E-07         | 0.850                | 9.03E-08             | 3 *                                   |                                       | · .                             |                                                  |
| · · · · · · · · · · · · · · · · · · · |                  |                        | Reported               | Average H     | ydraulic Con          | ductivity*       | ,                    | 9.0E-08              | cm/sec                                |                                       |                                 |                                                  |
| Flow pump ID #2                       | 44               |                        | ince ID #              | 1/6/7         | •                     | Differential P   |                      |                      | D#                                    | 263                                   |                                 |                                                  |
|                                       | 77               | Ove                    | n ID #                 | 14/15         |                       | Board Press      |                      |                      |                                       | 215                                   | -                               |                                                  |
| Syringe ID #2                         | 46               |                        |                        |               |                       | Pore Pressu      | re Transd            | ucer ID #            |                                       | 28                                    |                                 |                                                  |

|                            | T          | t             | 1                 | TIME       | ίχ<br>Ιχ                               | 1874 For                 | ge Street Tu                          |             | 84                   |                            |                        |                             |                    |                        |
|----------------------------|------------|---------------|-------------------|------------|----------------------------------------|--------------------------|---------------------------------------|-------------|----------------------|----------------------------|------------------------|-----------------------------|--------------------|------------------------|
|                            | T.E.       | I ST.         | )                 | ENGIN      | IEERING                                | Phone: 7                 | -<br>70-938-8233                      |             | 8                    |                            |                        |                             | Tested By          | ЕB                     |
|                            |            | <b>X</b>      |                   | Soil       |                                        | Fax: 770-                | 923-8973                              | A           |                      |                            |                        |                             | Date               | 07/12/12               |
|                            |            | <u> </u>      |                   | TESTS      | LLC                                    | Web: www                 | w.test-lic.com                        | XC17        | J =13 ²   |                            |                        |                             | Checked By         | 18                     |
| Client Pr. #               |            |               |                   | ·          | 2088/6.0                               |                          |                                       |             |                      | Lab, PR, #                 |                        | 1230-02                     |                    |                        |
| Pr. Name                   |            |               | For               |            | lant MGP Site -I                       |                          |                                       |             |                      | S. Type                    |                        | Mold                        |                    |                        |
| Sample ID                  | ;          |               |                   | 13794/C    | omposite Area A                        | <u>A, B, C, D)-</u>      | 9-1                                   |             |                      | Depth/Elev.                |                        | -                           |                    |                        |
| Subsample                  |            |               |                   |            | 6                                      |                          | · · · · · · · · · · · · · · · · · · · |             |                      | Add. Info                  |                        | Curing Age:                 | 14 Days            |                        |
|                            |            |               |                   | ASTM D     | -                                      |                          |                                       |             | -                    |                            |                        | aturated Porous             |                    |                        |
| <u> </u>                   |            |               |                   | · · · ·    | Materials U                            | sing a Fi                |                                       |             | eter (Met            | noa D, Con                 | stant Rate of F        |                             |                    |                        |
|                            | nitial Sar |               | a (Befor<br>1     |            |                                        | •                        | Test Dat                              | r           | ٦                    | 1                          |                        | Final Data (After Te        | est)               |                        |
| Height                     | -          |               | lin               |            | m Speed                                | • -                      |                                       | 13          | ł.                   |                            |                        |                             |                    |                        |
| Diameter<br>Area           |            | 3.012<br>7.13 | lin ²  |            | m Board Nu<br>m ² Cell Nurr |                          |                                       | 2<br>12     | 4                    | Average Heig               | neter of Sample        | <u>2.850</u> in<br>3.005 in | 7.24 cm<br>7.63 cm |                        |
| Volume                     |            | 335.69        | cm ³   | 0.01/19 ft | 2                                      | np Number                |                                       | 12<br>1A    | -                    | Average Dial<br>Area       | 7.09 in ²   | 45.76 cm ²       | 7.03 Cill          |                        |
| Mass                       |            | 589.80        | a                 | 1.30       |                                        | •                        |                                       | 2.80E-05    | cm ³ /sec | Volume                     | 331.23 cm ³ | 0.0117 ft ³      | Dry Density        | 86.0 pcf               |
| Specific Gra               | wity       | 2.575         | (Assume           | h          | B - Value                              | •                        |                                       | 0.95        | 1                    | Mass                       | 603.40 g               | 1.33 lb                     | Vol. of Voids      | 153.95 cm ³ |
| Dry Density                | •          | 84.7          | pcf               | ,          | Cell Pres                              | sure                     |                                       | 105.0       | psi                  | ļ                          | <b></b>                |                             | Vol. of Solids     | 177.27 cm ³ |
|                            |            |               | -                 |            | Back Pre                               | essure                   |                                       | 90.0        | psi                  |                            |                        |                             | Void Ratio         | 0.87                   |
|                            |            | ture Con      | ç                 | T          | Confining                              | g (Effective             | ) Pressure                            | 15.0        | psi                  | 1                          | Moisture               | Content                     | Saturation         | 95.4 %                 |
| Mass of wet                | ,          |               | 589.8D            | 4-         | Max Hea                                |                          |                                       | 151.23      | cm                   | 1                          | sample & tare          | 669.50 g                    |                    |                        |
| Mass of dry                | -          | tare          |                   | g .        | Min Head                               |                          |                                       | 150.53      | icm                  | -                          | sample & tare          | 522.80 g                    |                    |                        |
| Mass of tare<br>% Moisture |            | -             | 0.00<br>29.4      | 9          |                                        | n Gradient<br>n Gradient |                                       | 20.89       | 4                    | Mass of tare<br>% Moisture |                        | 67.00 g<br>32.2             |                    |                        |
|                            | FUNCT      |               | <u>29.4</u><br>Δt |            | Head                                   |                          | Temp.                                 | <u></u>     |                      | (cm/sec)                   | Niota                  | : Deaired Water Used for    | Dormonbility Tont  |                        |
| DATE                       | HOUR       | MIN           | (sec)             | READING    | (cm)                                   | Gradient                 | T _x (°C)                   |             |                      | @ 20 °C                    | Note                   | DESCRIPTION                 | Permeability rest. |                        |
| 07/12/12                   | 7          |               | (580)             | (psi)      | 151.23                                 | 20.89                    | 27.0                                  |             | -                    |                            | . NA                   |                             |                    | SCS                    |
| 07/12/12                   |            | 10            | 600               | 2.15       | 151.23                                 | 20.89                    | 27.0                                  | 2.93E-08    | 0.850                | 2.49E-08                   | 1                      |                             | 1                  | 505<br>02487:2488)     |
| 07/12/12                   | 7          | 20            | 600               | 2.14       | 150.74                                 | 20.82                    | 27.0                                  | 2.93E-08    | 0.850                | 2.49E-00                   |                        |                             |                    | NA                     |
| 07/12/12                   | · 7        | 30            | 600               | 2.14       | 150.00                                 | 20.89                    | 27.0                                  | 2.94E-08    | 0.850                | 2.50E-08                   | ¦                      | REM                         | I'<br>Arks         | <u> </u>               |
| 07/12/12                   | 7          | 40            | 600               | 2.14       | 150.53                                 | 20.79                    | 27.0                                  | 2.94E-08    | 0.850                | 2.50E-08                   | *                      |                             |                    |                        |
| 07/12/12                   | 7          | 50            | 600               | 2.15       | 151.23                                 | 20.89                    | 27.0                                  | 2.94E-08    |                      | 2.50E-08                   | *                      | •                           |                    |                        |
| 07/12/12                   | 8          | 0             | 600               | 2.15       | 151.23                                 | 20.89                    | 27.0                                  | 2.93E-08    |                      |                            | *                      |                             |                    |                        |
|                            |            |               | <u></u>           | L.,        |                                        |                          | lydraulic Con                         |             | <u></u>              |                            | cm/sec                 |                             |                    |                        |
| Flow pump [                | D#         | 2             | 2                 | ] в        | Balance ID #                           | 1/6/7                    |                                       |             | Pressure T           | ransducer ID :             | 1                      | 24/25                       |                    |                        |
| Thermomete                 |            |               | <br>77            | 1          | oven ID #                              | 14/15                    |                                       | Board Press |                      |                            |                        | 64                          |                    |                        |
| Syringe ID #               |            |               | 40                | 1          |                                        | <u></u>                  | •                                     | Pore Pressu | ire Transdi          | ucer ID #                  |                        | 26/27                       |                    |                        |
|                            |            |               |                   | •<br>      |                                        |                          |                                       |             |                      |                            |                        |                             |                    |                        |
|                            |            |               |                   |            |                                        |                          |                                       |             |                      |                            |                        |                             |                    |                        |
|                            |            |               |                   |            |                                        |                          |                                       |             |                      |                            |                        |                             |                    |                        |

• •

| · · ·          |            | •              | · · · ·               | TIMEL                              | Y               | 1874 Forg         | ge Street Tu        | cker, GA 3008    |                      |                 |             |                          |                                       |                                                                                                                 |                        |
|----------------|------------|----------------|-----------------------|------------------------------------|-----------------|-------------------|---------------------|------------------|----------------------|-----------------|-------------|--------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------|
|                | T.E.       | IST.           |                       | ENGINI                             | DERING          | 1                 | 70-938-8233         |                  | 8                    |                 |             | -                        |                                       | Tested By                                                                                                       | EB                     |
|                |            | X              |                       | Son                                |                 | Fax: 770-         | 923-8973            | A                |                      |                 | 1           |                          |                                       | Date                                                                                                            | 07/26/12               |
|                |            |                |                       | TESTS,                             | LLC             | Į.                | w.test-llc.com      | - <b>N</b> ERG   | -13                  |                 |             |                          |                                       | Checked By                                                                                                      | 18                     |
| lient Pr. #    |            |                |                       |                                    | 2088/6.0        | <u></u>           |                     |                  |                      | Lab. PR. #      | ·           |                          | 1230-0                                |                                                                                                                 |                        |
| r. Name        |            |                | For                   | mer North Pla                      | int MGP Site -I | SS Treatat        | oility Study        | · · ·            |                      | S. Type         |             |                          | Molo                                  |                                                                                                                 |                        |
| Sample ID      |            |                |                       | <u>13794/Co</u>                    | mposite Area A  | λ, Β. C. D)-      | 9-1                 |                  |                      | Depth/Elev.     |             |                          |                                       |                                                                                                                 |                        |
| Subsample      |            |                |                       |                                    | 7               |                   |                     |                  |                      | Add. Info       |             |                          | Curing Age:                           | 28 Days                                                                                                         |                        |
|                |            |                | •                     | ASTM D 5                           |                 |                   |                     |                  | -                    |                 | -           |                          | urated Porous                         |                                                                                                                 |                        |
|                |            |                |                       |                                    | Materials U     | sing a Fl         |                     |                  | eter (Met            | hod D, Con<br>T | stant Rat   | e of Flo                 |                                       | · · · · · · · · · · · · · · · · · · ·                                                                           |                        |
|                | nitial Sar | ·              | a (Befori<br>'        |                                    |                 |                   | Test Dat            |                  |                      |                 |             |                          | Final Data (After T                   | est)                                                                                                            |                        |
| leight         |            | 2.835          | in                    | 7.20 cm                            | <b>1</b> '      |                   |                     | 14               |                      | l               |             |                          | <u> </u>                              |                                                                                                                 |                        |
| Diameter       | •          | 3.008          | in<br>In ² | 7.64 cm<br>45.85 cm                |                 |                   |                     | 6                |                      | Average Heig    |             |                          | 2.825 in                              | 7.18 cm                                                                                                         |                        |
| Area<br>/olume |            | 7.11<br>330.14 |                       | 45.85 cm<br>0.0117 ft ³ |                 | iber<br>np Number |                     | 2A               |                      | Average Diar    | 7.05        | mple<br>]in ² | 2.995 in<br>45.45 cm ²     | 7.61 cm                                                                                                         |                        |
| lass           |            | 592.50         |                       | 1.31 lb                            | Flow Pur        | -                 |                     | 1.40E-05         | cm ³ /sec | Area<br>Volume  | 326.14      | cm ³          | 0.0115 ft ³                | Dry Density                                                                                                     | 89.1 pcf               |
| pecific Gra    | wity       | 2.575          | y<br>(Assumed         |                                    | B - Vaiue       |                   |                     | 0.95             |                      | Mass            | 603.90      | -                        | 1.33 lb                               | Vol. of Voids                                                                                                   | 145.34 cm ³ |
| by Density     | -          |                | DCf                   | ~/                                 | Cell Pres       |                   |                     |                  | psi                  | indy B          |             | -1°,                     |                                       | Vol. of Solids                                                                                                  | 180.80 cm ³ |
| ing Dening     |            |                | [Po:                  |                                    | Back Pre        |                   |                     |                  | psi                  |                 |             |                          |                                       | Void Ratio                                                                                                      | 0.80                   |
|                | Mois       | ture Cont      | ent                   |                                    | Confining       | g (Effective      | ) Pressure          |                  | psi                  |                 | Мо          | isture C                 | ontent                                | Saturation                                                                                                      | 95.2 %                 |
| Aass of wet    | sample &   | tare           | 592.50                | g                                  | Max Hea         | d                 |                     | 128.72           | cm                   | Mass of wet     | sample & ta | are                      | 693.80 g                              |                                                                                                                 | ······                 |
| Aass of dry    | sample &   | tare           | 465.10                | g                                  | Min Head        | ť                 |                     | 128.02           | cm                   | Mass of dry s   | sample & ta | re                       | 555.60 g                              |                                                                                                                 |                        |
| lass of tare   | <b>;</b>   |                | 0.00                  | g                                  | Maximun         | n Gradient        | i                   | 17.94            |                      | Mass of tare    | •           |                          | 90.50 g                               |                                                                                                                 |                        |
| 6 Moisture     |            |                | 27.4                  |                                    | Minimum         | Gradient          |                     | 17.84            |                      | % Moisture      |             |                          | 29.7                                  |                                                                                                                 |                        |
| TIME           | FUNCTI     | ON             | Δt                    | READING                            | Head            | Gradient          | • Temp.             | PERME            | ABILITY              | (cm/sec)        | 1           | Note:                    | Deaired Water Used for                | or Permeability Test.                                                                                           |                        |
| DATE           | HOUR       | MIN            | (sec)                 | (psi)                              | (cm)            | · · ·             | T _x (°C) | @ T _x | Rτ                   | @ 20 °C         | ļ           |                          | DESCRIPTION                           | <u> </u>                                                                                                        |                        |
| 07/26/12       | 6          | 0              |                       | .1.83                              | 128.72          | 17.94             | 27.0                |                  |                      |                 | ,           | NA                       |                                       | · [ · · ·                                                                                                       | USCS                   |
| 07/26/12       | 6          | 10             | 600                   | 1.82                               | 128.02          | 17.84             | 27.0                | 1.72E-08         | 0.850                | 1.46E-08        | 1           |                          |                                       | (ASTM                                                                                                           | D2487;2488)            |
| 07/26/12       | 6          | 20             | 600                   | 1.83                               | 128.72          | 17.94             | 27.0                | 1.72E-08         | 0.850                | 1.46E-08        |             |                          |                                       |                                                                                                                 | NA                     |
| 07/26/12       | 6          | 30             | 600                   | 1.82                               | 128.02          | 17.84             | 27.0                | 1:72E-08         | 0.850                | 1.46E-08        | *           |                          | REM                                   | IARKS                                                                                                           | ·                      |
| 07/26/12       | 6          | 40             | 600                   | 1.82                               | 128.02          | 17.84             | 27.0                | 1.73E-08.        | 0.850                | 1.47E-08        | <b>*</b>    | 1                        |                                       |                                                                                                                 |                        |
| 07/26/12       | 6          | 50             | 600                   | 1.83                               | 128.72          | 17.94             | 27.0                | 1.72E-08         | 0.850                | 1.46E-08        | *           |                          |                                       |                                                                                                                 |                        |
| 07/26/12       | 7          | 0              | 600                   | 1.83                               | 128.72          | 17.94             | 27.0                | 1.72E-08         | 0.850                | 1.46E-0B        | * .         |                          | · · · · · · · · · · · · · · · · · · · |                                                                                                                 |                        |
|                |            |                |                       | 1                                  | Reported        | Average H         | lydraulic Cor       | nductivity*      | •                    | 1.5E-08         | cm/sec      |                          | · · · · · · · · · · · · · · · · · · · |                                                                                                                 |                        |
| low pump l     | ID #       | 2              | 44                    | Ba                                 | ilance ID #     | 1/6/7             | Į                   | Differential F   | Pressure T           | ransducer ID    | #           |                          | 262                                   |                                                                                                                 |                        |
| Thermometer    | er ID #    | 3              | 77                    | 01                                 | /en ID #        | 14/15             |                     | Board Press      | ure Trans            | ducer ID #      |             |                          | _216                                  |                                                                                                                 |                        |
| Syringe ID #   | ŧ          | 2              | 45                    |                                    |                 |                   |                     | Pore Pressu      | re Transd            | ucer ID #       | <i>.</i>    |                          | 28                                    |                                                                                                                 |                        |
|                |            | ·              |                       |                                    |                 |                   |                     |                  |                      |                 |             | <u> </u>                 | <u> </u>                              |                                                                                                                 |                        |
|                |            |                |                       |                                    |                 |                   |                     |                  |                      |                 |             |                          |                                       | 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - |                        |

|                                       |                          |                                                    |                    |                                   |                                 | •                |                         |          |
|---------------------------------------|--------------------------|----------------------------------------------------|--------------------|-----------------------------------|---------------------------------|------------------|-------------------------|----------|
| F                                     | ÷                        | TIMELY                                             | 1874 Force S       | Street Tucker, GA                 | 30084                           |                  |                         |          |
| , , , , , , , , , , , , , , , , , , , | ÊE ST.                   | Engineerin                                         |                    |                                   |                                 |                  | Tested By               |          |
| 4                                     |                          | Soil                                               | Fax: 770-923       |                                   |                                 |                  | Date                    | 07/05/1  |
|                                       | $\Delta$                 | Tests, llc                                         |                    |                                   | 408HT0 FIE                      |                  | F                       |          |
| Client Pr. #                          |                          | 2088/                                              | Web: <u>www.te</u> | <u>st-iic.com</u>                 | Lab. PR. #                      |                  | Checked By<br>1230-02-1 | 18       |
| Pr. Name                              | Fo                       | ormer North Plant MGP S                            |                    | Study                             | S. Type                         |                  | Mold                    |          |
| Sample ID                             |                          | 13794/Composite Ar                                 |                    |                                   | Depth/Elev.                     |                  | -,                      |          |
| Subsample                             | <u> </u>                 | 2                                                  |                    |                                   | Add. Info                       |                  | ing Age: 7 Day          | ys       |
|                                       | ASTM                     | D 1633: Standard Test                              | Methods for Con    | pressive Strengt                  | h of Molded So                  | oil-Cement Cyli  | inders                  |          |
|                                       |                          |                                                    | METHOD             | B                                 |                                 |                  |                         |          |
|                                       | SAMPLE DA                | TA                                                 |                    | WATER CONT                        | ENT DETERN                      |                  |                         |          |
| nitial Heigh                          | t, in                    | 5.58                                               |                    | Mass of Wet S                     |                                 |                  | 1343.30                 |          |
| nitial Diame<br>Jeight-to-Di          | eter, in<br>ameter Ratio | 3:00                                               |                    | Mass of Dry Sa<br>Mass of Tare, g |                                 | e, g             | 1067.00<br>191.00       |          |
| Area, in ²                 |                          | 7.0                                                |                    | Moisture, %                       | 9                               |                  | 31.5                    |          |
| Volume, in ³               |                          | 39.6                                               | 60                 |                                   |                                 | · · · ·          |                         |          |
| Mass of Sar                           |                          | 1152                                               |                    | Note 1: Water co                  | ontent was obt <mark>a</mark> i | ned after shear. | from partial sa         | ample. 🗋 |
| Net Density<br>Dry Density;           |                          | <u>110</u><br>84.                                  |                    |                                   |                                 |                  |                         |          |
| Machine Sp                            | eed, in/min              | 0.05                                               | 50                 |                                   |                                 |                  |                         |          |
| Strain rate, '                        | % / min                  | 0.9                                                | 0                  |                                   |                                 |                  |                         |          |
|                                       |                          |                                                    | TEST               | Γ DATA                            |                                 |                  |                         |          |
|                                       | Load Cell ID:            | # 11                                               | <b>_</b>           |                                   | Dinita                          | al Caliper ID #  | 16                      |          |
|                                       | Compression              |                                                    |                    | . '                               |                                 | It Device ID #   |                         |          |
|                                       | Balance ID #             |                                                    | 7                  |                                   |                                 | Oven ID #        | 12/13/14                |          |
| Maximum                               | oad at Failure.          | lbf                                                |                    | 014                               | 7                               |                  |                         |          |
| viaximum Le                           | uau at Fallufe,          | , וטו<br>, י                                       |                    | 914                               |                                 | Failure Code     | 3                       |          |
| -                                     | cross-sectional          |                                                    |                    | 7.09                              | 4                               |                  |                         |          |
| -                                     | e Strength at F          | -                                                  | • •                | 129                               | - ·                             |                  |                         |          |
|                                       |                          | ght to Diameter Ratio                              | •                  | 1.00<br>129                       | -                               |                  | Eoilura Olarta          | ch       |
| -                                     | -                        | Strength at Failure, p<br>or based on H/D=1.15 (C. |                    | L.                                |                                 |                  | Failure Sket            |          |
| WULE Z AI                             | วงการสารางการ 18010      |                                                    | ESCRIPTION         | nu auu. cumecliui                 |                                 | -/               |                         |          |
|                                       |                          |                                                    |                    |                                   |                                 |                  |                         |          |
|                                       | 1                        |                                                    |                    |                                   |                                 | ]                | $\angle$                |          |
|                                       | · ·                      |                                                    |                    |                                   | •                               | Failure Type:    | Cone and S              | hoor'.   |
|                                       | L                        | USCS (A                                            | STM D2487: D24     | 488)                              | ··                              | <u>.</u>         | Cone and S              | nieai    |
|                                       |                          |                                                    |                    | ]                                 |                                 |                  |                         |          |
| • •                                   |                          |                                                    | L                  | -                                 |                                 |                  |                         |          |
|                                       |                          |                                                    | REMARKS            |                                   |                                 | 1                | ¢.                      | •        |
|                                       |                          |                                                    |                    | · .                               |                                 |                  |                         |          |
|                                       | 1                        |                                                    |                    | •                                 |                                 | 1                |                         |          |
|                                       | · · ·                    |                                                    |                    | ·                                 |                                 | J                |                         |          |
|                                       |                          |                                                    |                    |                                   |                                 |                  |                         |          |

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|                         | ·                 | TIMELY                      |                                       |                    |                   |                               |          |
|-------------------------|-------------------|-----------------------------|---------------------------------------|--------------------|-------------------|-------------------------------|----------|
|                         |                   |                             |                                       | Street Tucker, GA  | 30084             |                               | <u> </u> |
|                         | <u>ŕĒ I śr</u>    | ENGINEERING                 | Phone: 770-9                          | 938-8233           |                   | Tested By                     | AV       |
|                         | X                 | Soll                        | Fax: 770-923                          | 3-8973             |                   | , Date                        | 07/12/12 |
|                         |                   | TESTS, LLC                  | Web: <u>www.t</u> e                   | est-llc.com        |                   | Checked By                    | 18       |
| Client Pr. #            | 1                 | 2088/6.0                    | · · · ·                               |                    | Lab. PR. #        | 1230-02-1                     |          |
| Pr. Name                | Fo                | mer North Plant MGP Site -I |                                       |                    | S. Type           | Mold                          |          |
| Sample ID               |                   | 13794/Composite Area A      | , B, C, D)-9-1                        |                    | Depth/Elev.       |                               |          |
| Subsample               | L                 | 3                           |                                       |                    | Add. Info         | Curing Age: 14 Da             | ays      |
|                         | ASTM I            | ) 1633: Standard Test Met   | hods for Con                          | pressive Strengt   | h of Molded Soil  | l-Cement Cylinders            |          |
|                         |                   |                             |                                       |                    | 7                 |                               |          |
|                         |                   |                             | METHOD                                | В                  | <u> </u>          |                               |          |
|                         | SAMPLE DAT        | Г <b>л</b>                  | •                                     | WATER CONTI        |                   |                               |          |
| Initial Heigh           |                   | 5.634                       | 1                                     | Mass of Wet Sa     |                   |                               |          |
| Initial Diame           | •                 | 3.002                       | 1                                     | Mass of Dry Sa     |                   |                               |          |
|                         | iameter Ratio     | 1.88                        | 1                                     | Mass of Tare, g    |                   | 207.00                        |          |
| Area, in ²   |                   | 7.08                        | 1                                     | Moisture, %        |                   | 30.5                          |          |
| Volume, in ³ | -                 | 39.88                       | 1                                     |                    |                   |                               |          |
| Mass of Sar             |                   | 1170.80                     | · ·                                   | Note 1: Water co   | ntent was obtaine | ed after shear from partial s | ample.   |
| Wet Density             |                   | 111.8                       | 1                                     |                    |                   | •••••                         |          |
| Dry Density,            |                   | 85.7                        | 1                                     |                    |                   |                               |          |
| Machine Sp              | eed, in/min       | 0.050                       |                                       |                    |                   |                               |          |
| Strain rate, '          | % / min           | 0.89                        | ]                                     |                    |                   |                               |          |
|                         |                   |                             | TEO                                   | Γ DATA             |                   |                               |          |
|                         |                   |                             | IE3                                   | DATA               |                   |                               |          |
|                         | Load Cell ID #    | ŧ 11                        | 1                                     |                    | Digital           | Caliper ID # 16               |          |
|                         | Compression       |                             | 1                                     |                    |                   | Device ID # 10                | •        |
|                         | Balance ID #      | 1/7                         | 1                                     |                    |                   | Oven ID # 12/13/14            |          |
|                         |                   |                             | <b>.</b>                              | •                  |                   |                               |          |
| Maximum Lo              | oad at Failure,   | lbf                         | ÷                                     | 1531               | 7                 |                               |          |
|                         |                   | . 9                         |                                       |                    | F                 | ailure Code 3                 |          |
| •                       | Cross-sectional   |                             |                                       | 7.08               |                   |                               |          |
|                         | e Strength at F   | •                           |                                       | 216                |                   | •                             |          |
| Conversion              | Factor for Heig   | ht to Diameter Ratio        |                                       | 1.00               |                   |                               |          |
| Reported C              | ompressive S      | trength at Failure, psi     |                                       | 216                |                   | Failure Sket                  | ch       |
| Note 2: * - A c         | conversion factor | based on H/D=1.15 (C.F9     | 08 as 100% a                          | nd add. correction | per ASTM C42)     | - 7                           |          |
|                         |                   | DESCI                       | RIPTION                               |                    | _                 |                               |          |
|                         |                   |                             |                                       |                    |                   |                               |          |
|                         |                   |                             |                                       |                    |                   |                               |          |
|                         |                   |                             |                                       |                    | F                 | ailure Type:                  |          |
|                         |                   |                             |                                       |                    |                   | Cone and S                    | hear     |
|                         |                   | USCS (ASTM                  | D2487: D24                            | 188)               |                   |                               |          |
|                         |                   |                             |                                       |                    |                   |                               |          |
|                         |                   | -                           | MOKO                                  |                    |                   |                               |          |
|                         | ·                 | REM                         | IARKS                                 |                    |                   |                               |          |
|                         | 1                 |                             |                                       |                    |                   |                               |          |
|                         |                   |                             |                                       |                    | 1                 |                               |          |
|                         | L                 | <u>.</u>                    | · · · · · · · · · · · · · · · · · · · |                    | ]                 |                               |          |
| Ι.                      |                   |                             |                                       |                    |                   | ×                             |          |
| · ·                     |                   |                             |                                       | <u> </u>           |                   | · · · · · · · · · ·           | ···-     |
|                         |                   |                             |                                       |                    |                   |                               |          |

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|                         |                   | TIMELY                                             | 1874 Eorge 9                                  | Street Tucker, G   | A 30084                      |                 |                             | <del></del> _ |
|-------------------------|-------------------|----------------------------------------------------|-----------------------------------------------|--------------------|------------------------------|-----------------|-----------------------------|---------------|
| Ś                       | TE ST.            | Engineering                                        | -                                             |                    |                              |                 |                             |               |
|                         |                   |                                                    | Phone: 770-9                                  |                    |                              | ·               | Tested By                   | AV            |
|                         | Å i               | Soil                                               | Fax: 770-923                                  | -8973              | AUGHTO FILE                  |                 | Date                        | 07/26/12      |
| L                       |                   | TESTS, LLC                                         | Web: <u>www.te</u>                            | est-llc.com        |                              |                 | Checked By                  | 18            |
| Client Pr. #            |                   | 2088/6.0                                           |                                               |                    | Lab. PR. #                   |                 | 1230-02-1                   |               |
| Pr. Name<br>Sample ID   | F0                | ormer North Plant MGP Site<br>13794/Composite Area |                                               |                    | S. Type<br>Depth/Elev.       |                 | Mold                        |               |
| Subsample               |                   | <u>4</u>                                           | <u>, , , , , , , , , , , , , , , , , , , </u> |                    | Add. Info                    | Cu              | ring Age: 28 Da             | ays           |
|                         | ASTRA             | D 1633: Standard Test Me                           | ethoda for Cor                                | nyansiya Strong    | Tth of Moldod S              |                 |                             |               |
|                         | AS INL            | D 1055; Standard Test Mi                           | cinous for Con                                | ipressive arreng   |                              | Ju-Cement Cy    | muers                       |               |
|                         |                   | , · ·                                              | METHOD                                        | B                  |                              |                 |                             |               |
|                         |                   |                                                    |                                               |                    |                              |                 |                             |               |
| Initial Heig            | SAMPLE DA         | TA 5.648                                           | -1                                            |                    | TENT DETERN<br>Sample and Ta |                 | 1383.40                     | 1             |
| Initial Heig            |                   | 3.048                                              |                                               |                    | Sample and Tai               |                 | 1114.70                     |               |
|                         | Diameter Ratio    | 1.87                                               | -1                                            | Mass of Tare,      |                              | -, 9            | 208.90                      |               |
| Area, in ²   |                   | 7.15                                               | ]                                             | Moisture, %        | -                            |                 | 29.7                        |               |
| Volume, in              |                   | 40.38                                              | _                                             |                    |                              |                 |                             |               |
| Mass of Sa<br>Wet Densi |                   | <u>    1177.00</u><br>111.0                        | 4                                             | Note 1: Water o    | content was obtai            | ned after shea  | r from partial s            | ample.        |
| Dry Densit              |                   | 85.6                                               | -                                             |                    |                              |                 | · .                         |               |
|                         | peed, in/min      | 0.050                                              | -                                             |                    | · .                          |                 |                             |               |
| Strain rate             |                   | 0.89                                               | ]                                             |                    | -                            |                 |                             |               |
|                         |                   |                                                    | TEO                                           | ſ DATA             |                              |                 |                             |               |
|                         | ·                 |                                                    |                                               |                    |                              |                 |                             |               |
|                         | Load Cell ID      | · · · · · · · · · · · · · · · · · · ·              |                                               |                    |                              | al Caliper ID # |                             |               |
|                         |                   | Device ID # 10                                     |                                               |                    | Readou                       | ut Device ID #  |                             | ł             |
|                         | Balance ID #      | 1/7                                                |                                               |                    |                              | Oven D 4        | # 12/13/14                  | }             |
| Maximum                 | Load at Failure,  | lbf                                                |                                               | 2118               | -1                           |                 |                             |               |
|                         |                   |                                                    |                                               |                    |                              | Failure Code    | 3                           | 1             |
|                         | Cross-sectional   |                                                    |                                               | 7.15               |                              |                 |                             |               |
| -                       | ive Strength at f | -                                                  |                                               | 296                |                              |                 |                             |               |
|                         |                   | ght to Diameter Ratio                              |                                               | 1.00               |                              |                 | <b>E</b> 10 - 01 - 1        |               |
| -                       | =                 | Strength at Failure, psi                           |                                               | 296                |                              |                 | Failure Sket                | ich<br>1      |
| Note 2: * - A           | conversion facto  | or based on H/D=1.15 (C.F                          | .908 as 100% a<br>CRIPTION                    | ind add. correctio | on per ASTM C42              | 9               |                             | 1             |
|                         | 1                 | UE0                                                |                                               |                    |                              |                 |                             | !             |
|                         |                   |                                                    |                                               |                    |                              |                 | $ $ $\setminus$ $\setminus$ | ļ             |
|                         | 1                 |                                                    |                                               |                    |                              | Failure Type    | :<br>:                      | 4             |
|                         | L                 |                                                    |                                               |                    | ·····                        |                 | Cone and S                  | Shear         |
|                         |                   | USCS (ASTI                                         | M D2487: D24                                  | 488)<br>T          |                              | · .             | -                           |               |
| • .                     |                   |                                                    | L                                             | ļ                  |                              |                 |                             |               |
|                         | ,                 |                                                    | MARKS                                         |                    |                              |                 |                             |               |
|                         | <u> </u>          |                                                    |                                               |                    |                              | ļ               |                             |               |
|                         |                   |                                                    |                                               |                    |                              |                 |                             |               |
|                         | · · · ·           |                                                    |                                               |                    |                              |                 |                             |               |
|                         | L                 | ······································             |                                               |                    | ····                         | 1               |                             |               |
|                         |                   |                                                    |                                               |                    |                              |                 |                             |               |

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# **APPENDIX C**

# WETLAND DELINEATION AND PERMITTING



23713 W. PAUL ROAD, SUITE D PEWAUKEE, WI 53072 (P) 262.523.9000 (F) 262.523.9001

**ENVIRONMENTAL CONSULTANTS** 

Mr. Joe Hmieleski Lake County Stormwater Management Commission 500 Winchester Road Suite 201 Libertyville, IL 60048-1331 May 23, 2012 (2088/5.0)

RE: Request for Preliminary Wetland Jurisdictional Determination and Isolated Wetland Boundary Verification

Dear Mr. Hmieleski:

Natural Resource Technology, Inc. (NRT) is submitting this request for preliminary wetland jurisdictional determination and isolated wetland boundary verification on behalf of North Shore Gas Company (NSG), a subsidiary of Integrys Energy Group. This request pertains to wetland delineation and permitting at a former manufactured gas plant (MGP) site at 849 Pershing Road, Waukegan, Illinois. Integrys Business Support, LLC (IBS) manages the site for NSG. Hey and Associates, Inc., a subconsultant to NRT, is assisting NRT with wetland delineation and permitting and has prepared the following enclosed documents:

- Request for Preliminary Wetland Jurisdictional Determination and/or Isolated Wetland Boundary Verification Form, signed by IBS on behalf of NSG.
- Wetland Determination Data Forms.
- Aerial Exhibit depicting the surveyed wetland boundaries and data point locations.

Also enclosed is a check for the review fees associated with preliminary jurisdictional determination and boundary verification for the three identified wetlands.

If you have questions, please contact me directly at (262) 522-1210 or Scott Kuykendall with Hey and Associates, Inc at (847) 740-0888.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Glenn R. Luke Environmental Engineer

Enclosures: As Stated

cc: Naren Prasad, Integrys Business Support, LLC (electronic pdf only) Scott Kuykendall, Hey and Associates, Inc (electronic pdf only)

WWW.NATURALRT.COM



Revised March 7, 2008

STORMWATER MARAGEMENT COMMISSION 333-B PETERSON ROAD, LIBERTYVILLE, IL 60048 Phone 847-918-5260/Fax 847-918-9826 Request for Preliminary Wetland Jurisdictional Determination

and/or isolated Wetland Boundary Verification

| Date Requested:                                                      | May 17, 2012     | Project Name:                       | NSG Former North Plant |
|----------------------------------------------------------------------|------------------|-------------------------------------|------------------------|
| Property Address (e<br>photo clearly indica<br>street, municipality) | ting boundaries, | 849 N Pershing F<br>Waukegan, IL 60 |                        |
| Pin(s): 081530003                                                    | 30               |                                     |                        |

| Name &          | Address of Property Owner            | Name & Address of Requester (if not owner) ¹ |                                    |  |  |
|-----------------|--------------------------------------|---------------------------------------------------------|------------------------------------|--|--|
| Property Owner  | roperty Owner Naren M. Prasad, P.E.  |                                                         | Scott Kuykendall, CWS 027          |  |  |
| Address:        | 130 East Randolph Street, 22nd Floor | Company Name                                            | Hey and Associates, Inc.           |  |  |
| City/State/Zip: | Chicago, Illinois 60601              | Address                                                 | 26575 W. Commerce Drive, Suite 601 |  |  |
| Phone/Fax #:    | 312-240-4569                         | City/State/Zip                                          | Volo, Illinois 60073               |  |  |
| Fax             | 312-240-4725                         | Phone                                                   | 847-740-0888                       |  |  |
| Email Address:  | nmprasad@integrysgroup.com           | Fax                                                     | 847-740-2888                       |  |  |
|                 |                                      | Email Address                                           | scottk@heyassoc.com                |  |  |

| Preliminary JD Checklist (check items enclosed)                                                                                                                                         | Boundary Verification Checklist ² (check items enclosed)                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air Photo with Wetland Boundaries ( <i>Required</i> ).                                                                                                                                  | Flagged/Staked Wetland Boundaries (Required, except farmed wetlands shall not be flagged/staked).                                                                                        |
| For Agricultural Land: ³ NRCS Certified Wetland<br>Determination (within last 5 years) or Farmed<br>Wetland Determination Report by CWS Using<br>NRCS Procedures (Required). | For Agricultural Land ³ : NRCS Certified Wetland<br>Determination (within last 5 years) or Farmed Wetland<br>Determination Report by CWS Using NRCS Procedures<br>(Required). |
| Wetland Determinatión Report (Recommended)                                                                                                                                              | Air Photo with Wetland & Farmed Wetland Boundaries<br>(Required).                                                                                                                        |
| Data Point Locations & Data Sheets                                                                                                                                                      | Data Point Locations & Data Sheets (Required).                                                                                                                                           |
| (Recommended)                                                                                                                                                                           | Wetland Determination Report (Recommended)                                                                                                                                               |

Review fee listed below must be enclosed with this request form. Make check payable to: Lake County Stormwater Management Commission (check all that apply).

**Preliminary JD**  $\boxtimes$ Boundary Verification

\$720.00 for first wetland + \$180.00 each additional wetland \$480.00 for first wetland + \$180.00 each additional wetland

Date

The undersigned hereby grants the Lake County SMC and their agent's right-of-access to the subject property for the purpose of performing the requested preliminary JD and/or boundary verification.

SIDIE Signature of Property Owner

1 If requester is not the property owner(s), provide affidavit from owner(s) authorizing requester to seek this preliminary JD and/or boundary verification.

2 SMC can only varify isolated wetlands/waters boundaries. Waters of the U.S. boundaries must be verified by U.S. Army Corps of Engineers (USACE).

3 "Agricultural Land" is land that has been farmed at least one year in the last five years.

#### WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                        | City/0          | County:         | Waukegan/L          | ake Sampling Date:                                            | 5-2-12                 |
|--------------------------------------------------------|-----------------|-----------------|---------------------|---------------------------------------------------------------|------------------------|
| Applicant/Owner: NSG                                   |                 | State: Illinois |                     | Sampling Point:                                               | 1                      |
| Investigator(s): Hey and Associates (Kuykendall/Me     | osca)           | Secti           | on, Township        | , Range: S 15, T 45                                           | N, R 12E               |
| Landform (hillslope, terrace, etc.):                   |                 | Local r         | elief (concave      | e, convex, none):                                             | Concave                |
| Slope (%): Lat: 42.3751                                |                 | Long:           | -87.82320           | 5 Datum:                                                      |                        |
| Soil Map Unit Name 802B loamy                          |                 |                 | VWI C               | lassification:                                                |                        |
| Are climatic/hydrologic conditions of the site typical | for this time o | f the year?     | Y (If               | no, explain in remarks)                                       |                        |
| Are vegetation X , soil X , or hydr                    | rology X        | significant     | y disturbed?        | Are "normal circums                                           | topool                 |
|                                                        | ology           |                 | roblematic?         |                                                               | present? N             |
| SUMMARY OF FINDINGS                                    |                 |                 |                     | (If needed, explain any answ                                  |                        |
| Hydrophytic vegetation present? Y                      |                 | -               |                     | · · · · · · · · · · · · · · · · · · ·                         |                        |
| Hydric soil present? Y                                 |                 | Is the s        | sampled area        | within a wetland Y                                            |                        |
| Wetland hydrology present? Y                           | ·               |                 | ,<br>ptional wetlan | ·                                                             |                        |
| Remarks: (Explain alternative procedures here or in    |                 |                 |                     |                                                               | <u> </u>               |
| The subject property is a former manufacture           | •               | • •             | orgono vorio        | ve stores of investigation of                                 | partruction and        |
| remediation in the past. The pro-                      |                 |                 |                     |                                                               |                        |
| VEGETATION Use scientific names of pla                 |                 |                 | •                   |                                                               | <u> </u>               |
|                                                        | Absolute        | Dominan         | Indicator           | Dominance Test Workshe                                        | et                     |
| Tree Stratum (Plot size: )                             |                 | t Species       | Staus               |                                                               | -                      |
| 1 Fraxinus pennsylvanica                               | 5               | Ŷ               | FACW                | Number of Dominant Species<br>that are OBL, FACW, or FAC      |                        |
| 2                                                      |                 |                 |                     | Total Number of Dominan                                       | ·``                    |
| 3                                                      |                 |                 |                     | Species Across all Strata                                     |                        |
| 4                                                      |                 |                 |                     | Percent of Dominant Species                                   | 3                      |
| 5                                                      |                 |                 |                     | that are OBL, FACW, or FAC                                    | : <u>100.00%</u> (A/B) |
| -                                                      | .5              | = Total Cove    | er                  | · · · ·                                                       |                        |
| Sapling/Shrub stratum (Plot size:                      |                 |                 | •                   | Prevalence Index Worksh                                       | eet                    |
| 1 Salix discolor                                       | 20              | <u> </u>        | FACW                | Total % Cover of:                                             |                        |
| 2 Comus stolonifera                                    |                 | Y               | FACW                | OBL species 100 x 1                                           |                        |
| 3 Rhamnus frangula                                     | 10              | Y               | FAC                 | FACW species 35 x 2                                           |                        |
| 5                                                      |                 |                 |                     | FAC species <u>10</u> x 3<br>FACU species 0 x 4               |                        |
|                                                        | 40              | = Total Cov     | er                  | UPL species 0 x 5                                             |                        |
| Herb stratum (Plot size:                               | )               |                 | ~1                  | Column fotals 145 (A)                                         |                        |
| 1 Scirpus validus creber                               | _'<br>50        | Y               | OBL                 | Prevalence Index = B/A =                                      | 1.38                   |
| 2 Juncus effusus                                       |                 | Y               | OBL                 |                                                               |                        |
| 3 Eleocharis erythropoda                               | 20              | Y               | OBL                 | Hydrophytic Vegetation I                                      | ndicators:             |
| 4                                                      |                 |                 |                     | Rapid test for hydrophy                                       | rtic vegetation        |
| 5                                                      | _               |                 |                     | X Dominance test is >50                                       | %                      |
| 6                                                      |                 |                 |                     | X Prevalence index is ≤3                                      | .0 <b>*</b>            |
| 7                                                      |                 |                 | • •                 | Morphogical adaptatio                                         | ns* (provide           |
| 8                                                      |                 | ·               | <u> </u>            | supporting data in Ren                                        |                        |
| 9                                                      |                 |                 | • ••••••            | separate sheet)                                               |                        |
| 10                                                     |                 | - Total Oct     |                     | Problematic hydrophyt                                         | c vegetation*          |
| Maadyuuiga stratum (Distaire)                          | 100             | _= Total Cov    | rer.                | (explain)                                                     |                        |
| Woody vine stratum (Plot size:                         | /               |                 |                     | *Indicators of hydric soil and we<br>present, unless disturbe |                        |
| 2                                                      |                 |                 |                     | Hydrophytic                                                   |                        |
|                                                        |                 | = Total Cov     |                     | vegetation                                                    |                        |
|                                                        | ·               |                 |                     | present? Y                                                    | _                      |
| Remarks: (Include photo numbers here or on a se        | parate sheet)   |                 |                     |                                                               |                        |

| Profile Desc<br>Depth                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                    |                                                                   |                                                        |                                                                                                                                                         |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                           | Sampling Point:                                                                                                                                                                                                                                                                                                           | 1          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Depth                                                                                                                                                                                                                                                  | cription: (Descri                                                                                                                                                                                                                                                                                                  | ibe to the                                                        | e depth nee                                            |                                                                                                                                                         |                                                                                                                                                                     | indicato                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | r or confirm the                                                                          | absence of Indicators.)                                                                                                                                                                                                                                                                                                   |            |
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| <b>-</b>                                                                                                                                                                                                                                               | ck Histic (A3)                                                                                                                                                                                                                                                                                                     |                                                                   |                                                        | Stripped M                                                                                                                                              |                                                                                                                                                                     | 1.000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                           | ky Peat or Peat (S3) (LRR K, L                                                                                                                                                                                                                                                                                            |            |
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|                                                                                                                                                                                                                                                        | atified Layers (A5)                                                                                                                                                                                                                                                                                                | )                                                                 |                                                        | Loamy Gle                                                                                                                                               |                                                                                                                                                                     | (F2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ·                                                                                         | low Dark Surface (TF12)                                                                                                                                                                                                                                                                                                   |            |
|                                                                                                                                                                                                                                                        | m Muck (A10)                                                                                                                                                                                                                                                                                                       |                                                                   | ····                                                   | Depleted N                                                                                                                                              |                                                                                                                                                                     | (50)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                           | plain in remarks)                                                                                                                                                                                                                                                                                                         |            |
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| /etland Hy<br>rimary Indi                                                                                                                                                                                                                              | rdrology Indicato<br>icators (minimum                                                                                                                                                                                                                                                                              | ors:                                                              | osition, hyd                                           | drology an                                                                                                                                              | d vegeta                                                                                                                                                            | tion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Secon                                                                                     | dary Indicators (minimum of two                                                                                                                                                                                                                                                                                           | <u></u>    |
| /etland Hy<br>nmary Indi<br>Surface                                                                                                                                                                                                                    | rdrology Indicato<br>icators (minimum<br>Water (A1)                                                                                                                                                                                                                                                                | ors:                                                              | osition, hyd                                           | drology an                                                                                                                                              | d vegeta<br><u>apply)</u><br>c Fauna (B                                                                                                                             | tion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <u>Secon</u>                                                                              | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)                                                                                                                                                                                                                                                               | <u></u>    |
| Vetland Hy<br>nmary Indi<br>Surface<br>High Wa                                                                                                                                                                                                         | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)                                                                                                                                                                                                                                             | ors:                                                              | osition, hyd                                           | eck all that<br>Aquate                                                                                                                                  | d vegeta<br><u>apply)</u><br>c Fauna (B<br>quatic Plar                                                                                                              | tion.<br>13)<br>Its (B14)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <u>Secon</u>                                                                              | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)                                                                                                                                                                                                                                    | <u></u>    |
| Vetland Hy<br>nimary Indi<br>Surface<br>High Wa<br>X Saturatio                                                                                                                                                                                         | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)                                                                                                                                                                                                                                  | ors:                                                              | osition, hyd                                           | eck all that<br>Aquatin<br>X True A<br>Hydrog                                                                                                           | d vegeta<br><u>apply)</u><br>c Fauna (B<br>quatic Plar<br>gen Sulfide                                                                                               | tion.<br>13)<br>13 (B14)<br>Odor (C1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)                                                                                                                                                                                                     | <u></u>    |
| Vetland Hy<br>rimary Indi<br>Surfăce<br>High Wa<br>X Saturatio<br>Water N                                                                                                                                                                              | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>/larks (B1)                                                                                                                                                                                                                   | ors:                                                              | osition, hyd                                           | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidize                                                                                | d vegeta<br><u>apply)</u><br>c Fauna (B<br>quatic Plar<br>gen Sulfide                                                                                               | tion.<br>13)<br>13 (B14)<br>Odor (C1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)                                                                                                                                                                            | o requi    |
| Vetland Hy<br>nimary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer                                                                                                                                                                   | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>ful Deposits (B2)                                                                                                                                                                                               | ors:                                                              | osition, hyd                                           | eck all that<br>Aquate<br>X True A<br>Hydrog<br>Oxidize<br>(C3)                                                                                         | d vegeta<br><u>apply)</u><br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp                                                                                 | tion.<br>13)<br>13 (B14)<br>Odor (C1<br>heres on                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <u>Secon</u><br><br>)<br>Living Roots                                                     | dary Indicators (minimum of two<br>Surface Soi! Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image                                                                                                                                      | o requi    |
| Vetland Hy Inimary Indi Surface High Wa X Saturatio Water N Sedimer Drift De                                                                                                                                                                           | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>fint Deposits (B2)<br>posits (B3)                                                                                                                                                                               | ors:                                                              | osition, hyd                                           | Arology an<br>Arology an<br>Aquati<br>X True A<br>Hydrog<br>Oxidize<br>(C3)<br>Preser                                                                   | d vegeta<br>apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp                                                                                        | tion.<br>13)<br>Its (B14)<br>Odor (C1<br>heres on<br>uced Iron                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Secon<br>                                                                                 | dary Indicators (minimum of two<br>Surface Soll Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)                                                                                                   | o requi    |
| Vetland Hy<br>rimary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift Dej<br>Algal Ma                                                                                                                                          | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>fint Deposits (B2)<br>posits (B3)<br>at or Crust (B4)                                                                                                                                                           | ors:                                                              | osition, hyd                                           | Arology an<br>neck all that<br>Aquati<br>X True A<br>Hydrog<br>Oxidize<br>(C3)<br>Preser<br>Recen                                                       | d vegeta<br><u>apply)</u><br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp                                                                                 | tion.<br>13)<br>Its (B14)<br>Odor (C1<br>heres on<br>uced Iron                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Secon                 Living Roots              X           (C4)              illed Soils | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)                                                                       | o requi    |
| /etland Hy<br>rimary Indi<br>Surface<br>High Wa<br>Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep                                                                                                                                 | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>fut Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)                                                                                                                                             | ors:<br><u>of one is</u>                                          | osition, hyd                                           | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)                                             | d vegeta<br>apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>tt Iron Redu                                                         | tion.<br>13)<br>Its (B14)<br>Odor (C1<br>heres on<br>Icced Iron<br>Iccion in T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Secon                 Living Roots              X           (C4)              illed Soils | dary Indicators (minimum of two<br>Surface Soll Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)                                                                                                   | o requi    |
| /etland Hy<br>nimary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati                                                                                                                   | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>full Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria                                                                                                                    | ors:<br>of one is<br>al Imagery                                   | osition, hyd                                           | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M                                   | d vegeta<br>apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac                                          | tion.<br>13)<br>Its (B14)<br>Odor (C1<br>heres on<br>Iccon in T<br>Iccion in T<br>Iccion in T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Secon                 Living Roots              X           (C4)              illed Soils | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)                                                                       | o requi    |
| Vetland Hy<br>rimary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely                                                                                                       | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria<br>y Vegetated Conce                                                                                                | ors:<br><u>I of one is</u><br>al Imagen<br>ave Surfac             | osition, hyd                                           | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge                          | d vegeta<br><u>apply</u> )<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da   | 13)<br>13)<br>14s (B14)<br>Odor (C1<br>heres on<br>uced Iron<br>uction in T<br>ac (C7)<br>ata (D9)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)                                                                       | o requir   |
| Vetland Hy<br>rimary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift Dej<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water-S                                                                                           | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>full Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>fon Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5)                                                                        | ors:<br><u>I of one is</u><br>al Imagen<br>ave Surfac             | osition, hyd                                           | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge                          | d vegeta<br>apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac                                          | 13)<br>13)<br>14s (B14)<br>Odor (C1<br>heres on<br>uced Iron<br>uction in T<br>ac (C7)<br>ata (D9)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)                                                                       | o requir   |
| Vetland Hy<br>rimary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift Dej<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water-S<br>ield Obse                                                                              | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>full Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>fon Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5)                                                                        | ors:<br><u>I of one is</u><br>al Imagen<br>ave Surfac             | osition, hyd<br>s required: ch<br>y (B7)<br>ca (B8)    | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge                          | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in                       | 13)<br>13)<br>14s (B14)<br>Odor (C1<br>heres on<br>uced Iron<br>uction in T<br>ac (C7)<br>ata (D9)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)                                                                       | o requir   |
| Vetland Hy<br>Vetland Hy<br>Vetland High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water S<br>Sield Obse<br>Surface wal                                                                   | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5<br>rvations:<br>ter present?                                             | al Imagery<br>ave Surface)<br>Yes<br>Yes                          | osition, hyd<br><u>required: ch</u><br>(B7)<br>ce (B8) | drology an<br>heck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge<br>Other<br>No X<br>No X | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in<br>Depth (<br>Depth ( | tion.<br>13)<br>13 (B14)<br>Odor (C1<br>heres on<br>action in T<br>action                                                                                                                                                                                                                                                                       | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)<br>FAC-Neutral Test (D5)<br>Wetland<br>hydrology                      | o requir   |
| Vetland Hy<br>Primary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water-S<br>Field Obse<br>Surface wal                                                              | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5<br>rvations:<br>ter present?<br>present?                                  | ors:<br><u>of one is</u><br>al Imagery<br>ave Surfac<br>e)<br>Yes | osition, hyd<br><u>required: ch</u><br>(B7)<br>ce (B8) | drology an<br>neck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge<br>Other<br>No X         | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in<br>Depth (<br>Depth ( | tion.<br>13)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5)<br>13(5 | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)<br>FAC-Neutral Test (D5)<br>Wetland                                   | o requi    |
| Primary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water S<br>Field Obse<br>Surface wal<br>Nater table<br>Saturation p                                             | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imagery<br>ave Surface)<br>Yes<br>Yes<br>Yes                   | (B7)<br>ce (B8)                                        | drology an<br>heck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge<br>Other<br>No X<br>No X | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in<br>Depth (<br>Depth ( | tion.<br>13)<br>13 (B14)<br>Odor (C1<br>heres on<br>action in T<br>action                                                                                                                                                                                                                                                                       | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)<br>FAC-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? <u>Y</u> | o requi    |
| Vetland Hy<br>Primary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water S<br>Field Obse<br>Surface wal<br>Vater table<br>Saturation p                               | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imagery<br>ave Surface)<br>Yes<br>Yes<br>Yes                   | (B7)<br>ce (B8)                                        | drology an<br>heck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge<br>Other<br>No X<br>No X | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in<br>Depth (<br>Depth ( | tion.<br>13)<br>13 (B14)<br>Odor (C1<br>heres on<br>action in T<br>action                                                                                                                                                                                                                                                                       | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)<br>FAC-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? <u>Y</u> | o requi    |
| Vetland Hy<br>Primary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water-S<br>Sield Obse<br>Surface wal<br>Vater table<br>Saturation p<br>includes ca<br>Describe re | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imagery<br>ave Surface)<br>Yes<br>Yes<br>Yes                   | (B7)<br>ce (B8)                                        | drology an<br>heck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge<br>Other<br>No X<br>No X | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in<br>Depth (<br>Depth ( | tion.<br>13)<br>13 (B14)<br>Odor (C1<br>heres on<br>action in T<br>action                                                                                                                                                                                                                                                                       | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)<br>FAC-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? <u>Y</u> | o requir   |
| Vetland Hy<br>Primary Indi<br>Surface<br>High Wa<br>X Saturatio<br>Water N<br>Sedimer<br>Drift De<br>Algal Ma<br>Iron Dep<br>Inundati<br>Sparsely<br>Water S<br>Field Obse<br>Surface wal<br>Vater table<br>Saturation p                               | rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>Int Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>ion Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B5<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imagery<br>ave Surface)<br>Yes<br>Yes<br>Yes                   | (B7)<br>ce (B8)                                        | drology an<br>heck all that<br>Aquation<br>X True A<br>Hydrog<br>Oxidiza<br>(C3)<br>Preser<br>Recen<br>(C6)<br>Thin M<br>Gauge<br>Other<br>No X<br>No X | apply)<br>c Fauna (B<br>quatic Plar<br>gen Sulfide<br>ed Rhizosp<br>nce of Redu<br>ti Iron Redu<br>fuck Surfac<br>e or Well Da<br>(Explain in<br>Depth (<br>Depth ( | tion.<br>13)<br>13 (B14)<br>Odor (C1<br>heres on<br>action in T<br>action                                                                                                                                                                                                                                                                       | Secon                                                                                     | dary Indicators (minimum of two<br>Surface Soil Cracks (B6)<br>Drainage Patterns (B10)<br>Dry-Season Water Table (C2)<br>Crayfish Burrows (C8)<br>Saturation Visible on Aerial Image<br>Stunted or Stressed Plants (D1)<br>Geomorphic Position (D2)<br>FAC-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? <u>Y</u> | o requi    |

### WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                                                            | City/0   | County:          | Waukegan/L    | _akeSampling Date:                                            | 5-2-12                             |  |
|--------------------------------------------------------------------------------------------|----------|------------------|---------------|---------------------------------------------------------------|------------------------------------|--|
| Applicant/Owner: NSG                                                                       |          | State:           | Illinoi       | s Sampling Point:                                             | 2                                  |  |
| Investigator(s): Hey and Associates (Kuykendall/Mosca)                                     |          | Secti            | on, Township  | , Range: S 15, T 45                                           | N, R 12E                           |  |
| Landform (hillslope, terrace, etc.):                                                       |          | Local r          | elief (concav | e, convex, none):                                             | none                               |  |
| Slope (%): Lat: 42.374919                                                                  |          | Long:            | -87.82298     | 33 Datum:                                                     |                                    |  |
| Soil Map Unit Name 802B loamy                                                              |          |                  | NWI C         | Classification:                                               |                                    |  |
| Are climatic/hydrologic conditions of the site typical for thi                             | s time o | f the year?      | Y (I          | f no, explain in remarks)                                     |                                    |  |
| Are vegetation Y , soil Y , or hydrology                                                   |          |                  |               | Are "normal circums                                           | tancas                             |  |
| Are vegetation , soil , or hydrology                                                       |          |                  | roblematic?   |                                                               | oresent? N                         |  |
| SUMMARY OF FINDINGS                                                                        |          | •••              |               | (If needed, explain any ansv                                  | vers in remarks.)                  |  |
| Hydrophytic vegetation present? N                                                          |          |                  |               |                                                               | <u>_</u>                           |  |
| Hydric soil present? Y                                                                     |          | is the s         | sampled area  | a within a wetlanı N                                          |                                    |  |
| Wetland hydrology present? N                                                               |          |                  |               | nd site ID:                                                   |                                    |  |
|                                                                                            |          |                  |               |                                                               | ···                                |  |
| Remarks: (Explain alternative procedures here or in a set                                  |          |                  |               |                                                               |                                    |  |
| The subject property is a former manufactured gas<br>remediation in the past. The property |          |                  |               |                                                               |                                    |  |
|                                                                                            |          |                  |               |                                                               |                                    |  |
| VEGETATION Use scientific names of plants.                                                 |          |                  |               | Denstrance We date to be                                      | ·                                  |  |
|                                                                                            | solute   |                  | Indicator     | Dominance Test Workshe                                        | et                                 |  |
| · · · · · · · · · · · · · · · · · · ·                                                      | 50       | t Species<br>Y   | Staus<br>FAC  | Number of Dominant Species                                    |                                    |  |
| 1 Populus deltoídes                                                                        | 50       |                  | FAC           | that are OBL, FACW, or FAC:                                   | `` <i>`</i>                        |  |
| 3                                                                                          | ,        |                  | <u> </u>      | Total Number of Dominant<br>Species Across all Strata:        |                                    |  |
| 4                                                                                          |          |                  |               | -                                                             | ·································· |  |
| 5                                                                                          |          |                  |               | Percent of Dominant Species<br>that are OBL, FACW, or FAC:    |                                    |  |
| · · · · · · · · · · · · · · · · · · ·                                                      | 50       | ≈ Total Cove     |               |                                                               |                                    |  |
| Sapling/Shrub_stratun (Plot size: )                                                        |          | ,                |               | Prevalence Index Worksh                                       | eet                                |  |
| 1 Rhamnus cathartica                                                                       | 30       | Y                | FACU          | Total % Cover of:                                             |                                    |  |
| 2 Elaeagnus angustifolia                                                                   | 20       | Y                | FACU          | OBL species 0 x 1                                             | = 0                                |  |
| 3                                                                                          |          |                  |               | FACW species 10 x 2                                           | = 20                               |  |
| 4                                                                                          |          |                  |               | FAC species 80 x 3                                            | = 240                              |  |
| 5                                                                                          |          |                  |               | FACU species 80 x 4                                           | = 320 -                            |  |
| · · · · · · · · · · · · · · · · · · ·                                                      | 50       | = Total Cove     | er            | UPL species 20 x 5                                            | = 100                              |  |
| Herb stratum (Plot size:)                                                                  |          |                  |               | Column totals 190 (A)                                         | 680(B)                             |  |
| 1 Poa pratensis                                                                            | 30       | . <u> </u>       | FAC           | Prevalence Index = B/A =                                      | 3.58                               |  |
| 2 Solidago altissima                                                                       | 20       | <u> </u>         | FACU          |                                                               |                                    |  |
| 3 Bromus inermis                                                                           | 20       | <u>Y</u>         | UPL           | Hydrophytic Vegetation Ir                                     |                                    |  |
| 4 Trifolium pratense                                                                       | 10       | <u>N</u>         | FACU          | Rapid test for hydrophy                                       |                                    |  |
| 5 Solidago gigantea                                                                        | 10       | <u>N</u>         | FACW          | Dominance lest is >50%                                        |                                    |  |
| 6                                                                                          |          | •                | ·             | Prevalence index is ≤3                                        | .0*                                |  |
| 7                                                                                          |          |                  | ·             | Morphogical adaptation                                        |                                    |  |
| 8                                                                                          |          |                  | ·             | supporting data in Rem                                        | narks or on a                      |  |
| 9                                                                                          |          |                  | ·             | separate sheet)                                               |                                    |  |
|                                                                                            |          |                  |               | Problematic hydrophyti                                        | c vegetation*                      |  |
| 10                                                                                         | 00       | = Total Cov      | or            | (evolain)                                                     |                                    |  |
|                                                                                            | 90       | = Total Cov      | er            | (explain)                                                     |                                    |  |
| Woody vine stratum (Plot size:)                                                            |          | -                |               | *Indicators of hydric soil and we                             |                                    |  |
| <u>Woody vine stratum</u> (Plot size:)<br>1 <u>Vitis riparia</u>                           | 90<br>5  | = Total Cov<br>Y | er<br>FACW    | *Indicators of hydric soil and we<br>present, unless disturbe |                                    |  |
| Woody vine stratum (Plot size:)                                                            |          | -                | FACW          | *Indicators of hydric soil and we                             |                                    |  |

| Ph                                                                                                                                                                                                                                                                           | <u> </u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ibe to th                                                                                                    | e depth n                                    |           |                                                                                                                             |                                                                                                                                                                     | indicator                                                                                                                                  | or confirm t                                          | he absence                                                                                                              | e of indicators.)                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Depth                                                                                                                                                                                                                                                                        | <u>Matrix</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                              | 0.1                                          |           | dox Feat                                                                                                                    |                                                                                                                                                                     |                                                                                                                                            | T-sta                                                 |                                                                                                                         | Demarka                                                                                                                                                                                                                                                           |
| (Inches)                                                                                                                                                                                                                                                                     | Color (moist)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <u>%</u>                                                                                                     | Color (n                                     | noisi)    | <u>%</u>                                                                                                                    | Type*                                                                                                                                                               | Loc**                                                                                                                                      | Textu                                                 | ie -                                                                                                                    | Remarks                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                              | See                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                              |                                              | · · · · · |                                                                                                                             |                                                                                                                                                                     | <b> </b>                                                                                                                                   |                                                       |                                                                                                                         |                                                                                                                                                                                                                                                                   |
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|                                                                                                                                                                                                                                                                              | tic Epipedon (A2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                                                                                                            | _                                            |           | ndy Reda                                                                                                                    |                                                                                                                                                                     |                                                                                                                                            | <del>-</del> .                                        |                                                                                                                         | () (LRR K, L)                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                              | ick Histic (A3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              | -                                            |           | ••                                                                                                                          | atrix (S6)                                                                                                                                                          |                                                                                                                                            |                                                       | -                                                                                                                       | or Peat (S3) (LRR K, L, R)                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                              | drogen Sulfide (A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                              |                                              |           | -                                                                                                                           | ky Minera                                                                                                                                                           | · · · .                                                                                                                                    |                                                       |                                                                                                                         | Masses (F12) (LRR K, L, R)                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                              | atified Layers (A5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | )                                                                                                            | -                                            | _         |                                                                                                                             | ed Matri                                                                                                                                                            | • • •                                                                                                                                      |                                                       |                                                                                                                         | rk Surface (TF12)                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                              | m Muck (A10)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                              | _                                            |           |                                                                                                                             | atrix (F3)                                                                                                                                                          |                                                                                                                                            | Other                                                 | (explain in                                                                                                             | remarks)                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                              | pleted Below Dar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                              | e (A11)                                      |           |                                                                                                                             | Surface                                                                                                                                                             | • •                                                                                                                                        |                                                       |                                                                                                                         |                                                                                                                                                                                                                                                                   |
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| Sa                                                                                                                                                                                                                                                                           | ndy Mucky Minera                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | al (S1)                                                                                                      | · _                                          | Re        | dox Depi                                                                                                                    | ressions                                                                                                                                                            | (F8)                                                                                                                                       |                                                       |                                                                                                                         | e present, unless disturbed o                                                                                                                                                                                                                                     |
| 5 c                                                                                                                                                                                                                                                                          | m Mucky Peat or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Peat (S3                                                                                                     | 3)                                           |           |                                                                                                                             |                                                                                                                                                                     |                                                                                                                                            |                                                       |                                                                                                                         | problematic                                                                                                                                                                                                                                                       |
| estrictive                                                                                                                                                                                                                                                                   | Layer (if observ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ed):                                                                                                         |                                              |           | -                                                                                                                           |                                                                                                                                                                     | [                                                                                                                                          |                                                       |                                                                                                                         | ·····                                                                                                                                                                                                                                                             |
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| epth (inch<br>emarks:<br>The sub                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | onsists                                                                                                      | of potent                                    | ially c   | ontami                                                                                                                      | -<br>-<br>nated so                                                                                                                                                  | oils and v                                                                                                                                 |                                                       |                                                                                                                         | bils are assumed to be                                                                                                                                                                                                                                            |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL                                                                                                                                                                                                                         | oject property c<br>OGY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -                                                                                                            | of potent                                    | ially c   | ontami                                                                                                                      | nated so                                                                                                                                                            | oils and v                                                                                                                                 |                                                       |                                                                                                                         | - <u></u>                                                                                                                                                                                                                                                         |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>fetland Hy                                                                                                                                                                                                           | oject property c<br>OGY<br>ydrology Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -<br>ors:                                                                                                    |                                              |           |                                                                                                                             |                                                                                                                                                                     | oils and v                                                                                                                                 |                                                       |                                                                                                                         | - <u></u>                                                                                                                                                                                                                                                         |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>fetland Hy                                                                                                                                                                                                           | oject property c<br>OGY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -<br>ors:                                                                                                    |                                              |           |                                                                                                                             |                                                                                                                                                                     | bils and v                                                                                                                                 | vere not sa                                           | npied. So                                                                                                               | - <u></u>                                                                                                                                                                                                                                                         |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind                                                                                                                                                                                               | oject property c<br>OGY<br>ydrology Indicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -<br>ors:                                                                                                    |                                              |           | all that a                                                                                                                  |                                                                                                                                                                     |                                                                                                                                            | vere not sa                                           | npled. So                                                                                                               | bils are assumed to be                                                                                                                                                                                                                                            |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind                                                                                                                                                                                               | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -<br>ors:                                                                                                    |                                              |           | all that a                                                                                                                  | (ylage                                                                                                                                                              |                                                                                                                                            | vere not sa                                           | npied. So<br>condary Ind                                                                                                | bils are assumed to be                                                                                                                                                                                                                                            |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W                                                                                                                                                                          | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum<br>o Waler (A1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -<br>ors:                                                                                                    |                                              |           | <u>all that a</u><br>Aquatic<br>True Ac                                                                                     | a <u>pply)</u><br>Fauna (B<br>quatic Plai                                                                                                                           |                                                                                                                                            | vere not sar<br>                                      | npied. So<br>condary Ind<br>Surface                                                                                     | Dils are assumed to be<br>licators (minimum of two requ<br>Soil Cracks (B6)                                                                                                                                                                                       |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>(etland Hy<br>firmary Ind<br>Surface<br>High W<br>Saturati                                                                                                                                                           | oject property c<br>OGY<br>ydrology Indicato<br>licators (minimum<br>o Water (A1)<br>fater Table (A2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -<br>ors:                                                                                                    |                                              |           | all that a<br>Aquatic<br>True Ac<br>Hydrogo                                                                                 | a <u>pply)</u><br>Fauna (B<br>quatic Plan<br>en Sulfide                                                                                                             | 313)<br>nts (B14)<br>a Odor (C1)                                                                                                           | vere not sar<br>                                      | npied. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Sea                                                              | Diis are assumed to be<br>licators (minimum of two requ<br>Soil Cracks (B6)<br>Patterns (B10)                                                                                                                                                                     |
| Pepth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>YDROL<br>Surface<br>High W<br>Saturati<br>Water M                                                                                                                                                                   | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>water (A1)<br>'ater Table (A2)<br>ion (A3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -<br>ors:                                                                                                    |                                              |           | all that a<br>Aquatic<br>True Ac<br>Hydrogo                                                                                 | a <u>pply)</u><br>Fauna (B<br>quatic Plan<br>en Sulfide                                                                                                             | 313)<br>nts (B14)<br>a Odor (C1)                                                                                                           | vere not sa                                           | npied. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seas<br>Crayfish                                                 | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)                                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL-<br>fetland Hy<br>fimary Ind<br>Surface<br>High W<br>Saturati<br>Saturati<br>Sedime                                                                                                                                     | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>a Water (A1)<br>ater Table (A2)<br>lion (A3)<br>Marks (B1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -<br>ors:                                                                                                    |                                              |           | all that a<br>Aquatic<br>True Ac<br>Hydrogo<br>Oxidize<br>(C3)                                                              | apply)<br>Fauna (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp                                                                                                        | 313)<br>nts (B14)<br>a Odor (C1)                                                                                                           | vere not sa<br><u>Se</u><br>iving Roots               | npied. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seat<br>Crayfish<br>Saturatio                                    | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>YDROL<br>Ydrace<br>YDROL<br>High W<br>Saturati<br>Saturati<br>Saturati<br>Sedime<br>Drift De                                                                                                                         | oject property c<br>OGY<br>ydrology Indicate<br>icators (minimum<br>e Water (A1)<br>fater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -<br>ors:                                                                                                    |                                              |           | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presend                                                   | apply)<br>Fauina (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red                                                                                          | 113)<br>Ints (B14)<br>a Odor (C1)<br>pheres on L<br>uced Iron ((                                                                           | vere not sau<br>Se<br>iving Roofs<br>C4)              | npled. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Sead<br>Crayfish<br>Saturatio<br>Stunted                         | bils are assumed to be<br>licators (minimum of two requised<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C6                                                                                     |
| Peth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>YDROL<br>fetland Hy<br>fimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M                                                                                                       | oject property c<br>OGY<br>ydrology Indicate<br>icators (minimum<br>water (A1)<br>fater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -<br>ors:                                                                                                    |                                              |           | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presend                                                   | apply)<br>Fauina (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red                                                                                          | 113)<br>nts (B14)<br>Odor (C1)<br>pheres on L                                                                                              | vere not sau<br>Se<br>iving Roofs<br>C4)              | npled. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seat<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor               | bils are assumed to be<br>licators (minimum of two requised<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C3)<br>on Visible on Aerial Imagery (C4<br>or Stressed Plants (D1)                                                          |
| Peth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>(etland Hy<br>cimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M<br>Iron De                                                                                                     | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum<br>a Waler (A1)<br>ater Table (A2)<br>lon (A3)<br>Marks (B1)<br>at Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ors:<br>of one is                                                                                            | s required;                                  |           | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)                                 | apply)<br>Fauina (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red                                                                                          | 813)<br>nts (B14)<br>a Odor (C1)<br>bheres on L<br>uced Iron (<br>uced Iron (<br>uction in Till                                            | vere not sau<br>Se<br>iving Roofs<br>C4)              | npled. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seat<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor               | Dils are assumed to be<br><u>licators (minimum of two requ</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C9<br>or Stressed Plants (D1)<br>phic Position (D2)                                 |
| Peth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>(etland Hy<br>fimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat                                                                                          | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum<br>a Waler (A1)<br>ater Table (A2)<br>lon (A3)<br>Marks (B1)<br>ant Deposits (B2)<br>eposits (B3)<br>liat or Crust (B4)<br>posits (B5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ors;<br>of one is                                                                                            | <u>s required;</u><br>y (B7)                 |           | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)                                 | apply)<br>Fauina (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>Iron Redu                                                                             | 113)<br>Ints (B14)<br>Odor (C1)<br>Dheres on L<br>uced Iron (<br>uced Iron (<br>uction in Till<br>ce (C7)                                  | vere not sau<br>Se<br>iving Roofs<br>C4)              | npled. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seat<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor               | Dils are assumed to be<br><u>licators (minimum of two requ</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C9<br>or Stressed Plants (D1)<br>phic Position (D2)                                 |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>/etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel                                                                               | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>e Water (A1)<br>'ater Table (A2)<br>lon (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>con Visible on Aeria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ors:<br>of one is<br>al Imager<br>ave Surfa                                                                  | <u>s required;</u><br>y (B7)                 |           | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge             | apply)<br>Fauna (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>lron Redu<br>uck Surfar<br>or Well D                                                   | 113)<br>Ints (B14)<br>Odor (C1)<br>Dheres on L<br>uced Iron (<br>uced Iron (<br>uction in Till<br>ce (C7)                                  | vere not sau<br>Se<br>iving Roots<br>C4)<br>Isd Soils | npled. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seat<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor               | Dils are assumed to be<br><u>licators (minimum of two requ</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C9<br>or Stressed Plants (D1)<br>phic Position (D2)                                 |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL<br>/etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Aigal M<br>Iron De<br>Inundat<br>Sparsel                                                                              | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>e Water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>iat or Crust (B4)<br>posits (B5)<br>iton Visible on Aeri-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ors:<br>of one is<br>al Imager<br>ave Surfa                                                                  | <u>s required;</u><br>y (B7)                 |           | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge             | apply)<br>Fauna (B<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>lron Redu<br>uck Surfar<br>or Well D                                                   | 13)<br>nts (B14)<br>Odor (C1)<br>oheres on L<br>uced Iron (<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)                        | vere not sau<br>Se<br>iving Roots<br>C4)<br>Isd Soils | npled. So<br>condary Ind<br>Surface<br>Drainage<br>Dry-Seat<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor               | Dils are assumed to be<br><u>licators (minimum of two requ</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C9<br>or Stressed Plants (D1)<br>phic Position (D2)                                 |
| hydric.<br>YDROL-<br>Vetland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Aigal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S<br>ield Obse<br>Surface wa                                                                            | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum<br>e Water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>cion Visible on Aeri-<br>ly Vegetated Conce<br>Stained Leaves (B3)<br>ervations:<br>ther present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ors:<br>of one is<br>of one is<br>al Imager<br>ave Surfa<br>a)<br>Yes                                        | <u>s required;</u><br>y (B7)                 | check<br> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I           | apply)<br>Fauina (E<br>quatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>lron Red<br>uck Surfac<br>or Well D<br>Explain in<br>Depth (                          | 13)<br>nts (B14)<br>Odor (C1)<br>oheres on L<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)<br>Remarks)<br>(inches):              | vere not sau<br>Se<br>iving Roots<br>C4)<br>Isd Soils | npied. So<br>condary Ind<br>Surface :<br>Drainage<br>Dry-Seas<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor<br>FAC-Nei  | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C9<br>or Stressed Plants (D1)<br>phic Position (D2)<br>utral Test (D5)                     |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL<br>/etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water S<br>ield Obse                                                      | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>a Water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>fat or Crust (B4)<br>posits (B5)<br>fion Visible on Aeri-<br>ly Vegetated Conce<br>Stained Leaves (B5)<br>ervations:<br>ther present?<br>a present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ors:<br>of one is<br>of one is<br>ave Surfa<br>ave Surfa<br>a)<br>Yes<br>Yes                                 | <u>s required;</u><br>y (B7)                 | Check<br> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I           | apply)<br>Fauina (B<br>guatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>iron Redu<br>iron Redu<br>uck Surfac<br>or Well D<br>Explain In<br>Depth (<br>Depth ( | 13)<br>nts (B14)<br>odor (C1)<br>oheres on L<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)<br>Remarks)<br>(inches):<br>(inches): | vere not sau<br>Se<br>iving Roots<br>C4)<br>Isd Soils | npied. So<br>condary Ind<br>Surface :<br>Drainage<br>Dry-Seas<br>Crayfish<br>Saturatio<br>Stunted<br>Geomory<br>FAC-Nei | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C4<br>or Stressed Plants (D1)<br>phic Position (D2)<br>utral Test (D5)<br>ttand<br>Irology |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>/etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S<br>ield Obse<br>aturation                                          | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum<br>Water (A1)<br>'ater Table (A2)<br>lon (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>cion Visible on Aeric<br>ly Vegetated Conce<br>Stained Leaves (B3)<br>ervations:<br>ter present?<br>present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ors:<br>of one is<br>of one is<br>al Imager<br>ave Surfa<br>a)<br>Yes                                        | <u>s required;</u><br>y (B7)                 | check<br> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I           | apply)<br>Fauina (B<br>guatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>iron Redu<br>iron Redu<br>uck Surfac<br>or Well D<br>Explain In<br>Depth (<br>Depth ( | 13)<br>nts (B14)<br>Odor (C1)<br>oheres on L<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)<br>Remarks)<br>(inches):              | vere not sau<br>Se<br>iving Roots<br>C4)<br>Isd Soils | npied. So<br>condary Ind<br>Surface :<br>Drainage<br>Dry-Seas<br>Crayfish<br>Saturatio<br>Stunted<br>Geomory<br>FAC-Nei | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C9<br>or Stressed Plants (D1)<br>phic Position (D2)<br>utral Test (D5)                     |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>/etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Aigal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S<br>ield Obse<br>aturation<br>ncludes c                             | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>a Water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ator Crust (B4)<br>posits (B3)<br>dat or Crust (B4)<br>posits (B5)<br>dat or Crust (B4)<br>dat or Cru | ors:<br>of one is<br>of one is<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa | <u>s required;</u><br>y (B7)<br>ice (B8)     | Check<br> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I<br>X<br>X | apply)<br>Fauna (B<br>guatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>lron Redu<br>uck Surfac<br>or Well D<br>Explain In<br>Depth (<br>Depth (               | ants (B14)<br>a Odor (C1)<br>oheres on L<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)<br>a Remarks)<br>(inches):<br>(inches):   | vere not sai                                          | npled. So<br>condary Ind<br>Surface 3<br>Drainage<br>Dry-Seas<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor<br>FAC-Net  | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C4<br>or Stressed Plants (D1)<br>phic Position (D2)<br>utral Test (D5)<br>ttand<br>Irology |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>(etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S<br>ield Obse<br>urface wa<br>/ater table<br>aturation<br>ncludes c | oject property c<br>OGY<br>ydrology Indicate<br>licators (minimum<br>Water (A1)<br>'ater Table (A2)<br>lon (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>cion Visible on Aeric<br>ly Vegetated Conce<br>Stained Leaves (B3)<br>ervations:<br>ter present?<br>present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ors:<br>of one is<br>of one is<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa | <u>s required;</u><br>y (B7)<br>ice (B8)     | Check<br> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I<br>X<br>X | apply)<br>Fauna (B<br>guatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>lron Redu<br>uck Surfac<br>or Well D<br>Explain In<br>Depth (<br>Depth (               | ants (B14)<br>a Odor (C1)<br>oheres on L<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)<br>a Remarks)<br>(inches):<br>(inches):   | vere not sai                                          | npled. So<br>condary Ind<br>Surface 3<br>Drainage<br>Dry-Seas<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor<br>FAC-Net  | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C4<br>or Stressed Plants (D1)<br>phic Position (D2)<br>utral Test (D5)<br>ttand<br>Irology |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>/etiand Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>Sedime<br>Drift De<br>Aigal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S<br>ield Obse<br>urface wa<br>Vater table                           | oject property C<br>OGY<br>ydrology Indicate<br>licators (minimum<br>a Water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ator Crust (B4)<br>posits (B3)<br>dat or Crust (B4)<br>posits (B5)<br>dat or Crust (B4)<br>dat or Cru | ors:<br>of one is<br>of one is<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa<br>ave Surfa | <u>s required;</u><br>y (B7)<br>ice (B8)     | Check<br> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I<br>X<br>X | apply)<br>Fauna (B<br>guatic Plan<br>en Sulfide<br>d Rhizosp<br>ce of Red<br>lron Redu<br>uck Surfac<br>or Well D<br>Explain In<br>Depth (<br>Depth (               | ants (B14)<br>a Odor (C1)<br>oheres on L<br>uced Iron (<br>uction in Till<br>ce (C7)<br>ata (D9)<br>a Remarks)<br>(inches):<br>(inches):   | vere not sai                                          | npled. So<br>condary Ind<br>Surface 3<br>Drainage<br>Dry-Seas<br>Crayfish<br>Saturatio<br>Stunted<br>Geomor<br>FAC-Net  | bils are assumed to be<br>licators (minimum of two reat<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>on Visible on Aerial Imagery (C4<br>or Stressed Plants (D1)<br>phic Position (D2)<br>utral Test (D5)<br>ttand<br>Irology |

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#### WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                                   |                                        | City/0              | County:              | Waukegan/L             | ake Sampling Date:                                          | 5-2-12            |
|-------------------------------------------------------------------|----------------------------------------|---------------------|----------------------|------------------------|-------------------------------------------------------------|-------------------|
| Applicant/Owner: NSG                                              |                                        |                     | State:               | Illinois               | Sampling Point:                                             | 3                 |
| Investigator(s): Hey and Associates (Kuyke                        | endall/Mosca                           | ı)                  | Sectio               | on, Township,          | , Range: S 15, T 4                                          | 5N, R 12E         |
| Landform (hillslope, terrace, etc.):                              |                                        |                     | Local re             | elief (concave         | , convex, none):                                            | Concave           |
| Slope (%): Lat:                                                   | 42.374063                              |                     | Long:                | -87.82307              | 3 Datum:                                                    |                   |
| Soil Map Unit Name 802B Ioamy                                     |                                        |                     |                      | VWI C                  | lassification:                                              |                   |
| Are climatic/hydrologic conditions of the site                    | e typical for t                        | his time of         | f the year?          | Y (If                  | no, explain in remarks)                                     |                   |
| Are vegetation Y, soil Y                                          | , or hydrolog                          | ay Y .              | significantly        | / disturbed?           | Are "normal circum                                          | stances"          |
| Are vegetation , soil                                             | , or hydrolog                          | 3y                  | naturally pr         | oblematic?             | Ale nonna circuit                                           | present? N        |
| SUMMARY OF FINDINGS                                               |                                        | · · · ·             |                      |                        | (If needed, explain any ans                                 | wers in remarks.) |
| Hydrophytic vegetation present?                                   | Y                                      |                     |                      |                        | <u></u>                                                     |                   |
| Hydric soil present?                                              | Y                                      | ļ                   | is the s             | ampled area            | within a wetlan Y                                           |                   |
| Wetland hydrology present?                                        | Y                                      |                     | f yes, op            | tional wetland         | d site ID:                                                  |                   |
| Remarks: (Explain alternative procedures h                        | ere or in a r                          |                     |                      | · ·- ·                 |                                                             |                   |
|                                                                   |                                        |                     |                      |                        | n etaron of investigation .                                 | construction and  |
| The subject property is a former manu<br>remediation in the past. |                                        |                     |                      |                        | Il material & contaminated                                  |                   |
| VEGETATION Use scientific name                                    |                                        |                     |                      |                        |                                                             |                   |
|                                                                   |                                        |                     | Demínen              | Indianton              | Dominance Test Worksh                                       | eet               |
| Tree Stratum (Plot size:                                          |                                        | Absolute<br>% Cover | Dominan<br>t Species | Indicator<br>Staus     |                                                             |                   |
| 1                                                                 |                                        |                     |                      |                        | Number of Dominant Specie<br>that are OBL, FACW, or FAC     |                   |
| 2                                                                 |                                        |                     |                      |                        | Total Number of Domina                                      | ······            |
| 3                                                                 |                                        |                     |                      |                        | Species Across all Strat                                    |                   |
| 4                                                                 |                                        |                     |                      |                        | Percent of Dominant Specie                                  |                   |
| 5                                                                 |                                        |                     |                      |                        | that are OBL, FACW, or FAC                                  |                   |
|                                                                   |                                        | 0                   | = Total Cove         | r.                     |                                                             |                   |
| Sapling/Shrub stratun (Plot size:                                 | )                                      |                     |                      |                        | Prevalence Index Works                                      | heet              |
| 1 Salix discolor                                                  | ·                                      | 20                  | <u> </u>             | FACW                   | Total % Cover of:                                           |                   |
| 2 Cornus stolonifera                                              |                                        | 20                  | <u>Y</u>             | FACW                   | OBL species 30 x                                            |                   |
| 3 Rhamnus frangula                                                |                                        | 20                  | <u> </u>             | FAC                    | · · · · · · · · · · · · · · · · · · ·                       | 2 = 100           |
| 4                                                                 |                                        | <del>-</del>        | - <u></u>            |                        | ·                                                           | 3 = 240           |
| 5                                                                 |                                        | 60                  | = Total Cove         |                        | · · · · · · · · · · · · · · · · · · ·                       | 4 = 0<br>5 = 0    |
| Herb stratum (Plot size:                                          | ,<br>N                                 |                     |                      | -1                     | UPL species 0 x<br>Column totals 160 (/                     |                   |
| 1 Panicum virgatum                                                | ·'                                     | 50                  | Y                    | FAC                    | Prevalence Index = B/A =                                    |                   |
| 2 Juncus effusus                                                  |                                        | 20                  | · <u> </u>           | OBL                    |                                                             | 2.01              |
| 3 Eleocharis erythropoda                                          | ······································ | 10                  | N                    | OBL                    | Hydrophytic Vegetation                                      | Indicators:       |
| 4 Potentilla anserina                                             | - <u></u>                              | 10                  | N                    | FACW                   | Rapid test for hydropi                                      |                   |
| 5 Juncus dudleyi                                                  |                                        | 10                  | N                    | FAC                    | X Dominance test is >5                                      |                   |
| 6                                                                 | · · ·                                  |                     |                      |                        | X Prevalence index is ≤                                     | 3.0*              |
| 7                                                                 | · · · · · · · · · · · · · · · · ·      |                     |                      |                        | Morphogical adaptation                                      | nns* (nrovide     |
| 8                                                                 |                                        |                     |                      |                        | supporting data in Re                                       |                   |
| 9                                                                 |                                        |                     | . <u> </u>           |                        | separate sheet)                                             |                   |
| 10                                                                |                                        |                     |                      | ··· <b>··</b> ········ | Problematic hydrophy                                        | tic vegetation*   |
|                                                                   |                                        | 100                 | = Total Cove         | er '                   | (explain)                                                   |                   |
| Woody vine stratum (Plot size:<br>1                               | )                                      |                     |                      |                        | *Indicators of hydric soil and v<br>present, unless disturt |                   |
| 2                                                                 |                                        |                     |                      |                        | Hydrophytic                                                 |                   |
|                                                                   |                                        | 0                   | = Total Cove         | ei                     | vegetation                                                  |                   |
|                                                                   |                                        |                     |                      |                        | present? Y                                                  | <u> </u>          |
| Remarks: (Include photo numbers here or                           | on a separa                            | ite sheet)          |                      |                        |                                                             |                   |

| offic Description: (Description to depth needed to document the Indicator or confirm the absence of indicators.)       Depth       Remarks       Remarks         See       Color (moist)       %       Color (moist)       %       Texture       Remarks         Nemerits       Nemerits       Nemerits       Nemerits       Nemerits       Nemerits       Nemerits         Below       Nemerits       Nemerits       Nemerits       Nemerits       Nemerits         ype: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M ~1         Histeol (A1)       Sandy Gloyed Matrix (S4)       Coster Problematic Hydric Solis:       Nemerits         Histeol (A1)       Sandy Redox (S5)       Dark Surface (A12) (LRR K, L)       Beak Histeol (A3)       Stripped Matrix (S4)       Coster (explain in cemarks)         Depleted Below Dark Surface (A12)       Dary Gloyed Matrix (S4)       Coster (explain in cemarks)       Other (explain in cemarks)         Depleted Below Dark Surface (F12)       Losany Gloyed Matrix (S4)       Other (explain in cemarks)       Other (explain in cemarks)         Depleted Below Dark Surface (F12)       Redox Dark Surface (F12)       Thick Dark Surface (A12)       Depleted Dark Surface (F12)       Thick Dark Surface (A12)       Depleted Dark Surface (F12)         Thick Dark Surface (A12)       Depleted Dark Su                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Profile Dec      | cription: /Descr        | ibe to the r   | lenth needer   | to docu            | ment the           | indicato     | r or confirm   | he absence    | of indicators )          |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------|----------------|----------------|--------------------|--------------------|--------------|----------------|---------------|--------------------------|-------------|
| Color (mols)       %       Color (mols)       %       Type* Loc**       Texture       Remarks         Nemarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                         |                |                |                    |                    |              |                |               |                          |             |
| Remarks       Below       Below         Below       Below       Below         ype: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       **Location: PL = Pore Lining, M = J         Hydric Soli Indicators:       Indicators for Problematic Hydric Solis:         Histo (A1)       Sandy Gleyod Matrix (S4)       Coast Praite Redox (A10) (LRR K, L, R)         Hydric Soli Indicators:       Indicators for Problematic Hydric Solis:         Hydric Soli Indicators:       Dark Surface (S7) (LRR K, L)         Hydric Solifie (A4)       Loarny Gleyod Matrix (S2)       Son Mucky Peat or Peat (S3) (LRR K, L)         Stratified Layers (A5)       Depleted Matrix (S3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F7)       *Indicators of hydrophytic vegotation and wight of peat or Peat (S3)         Sandy Mucky Mineral (S1)       Redox Dark Surface (F7)       *Indicators of hydrophytic vegotation and wight of peat or Paat (S3)         Periotic House (for beserved):       periotic Advance (F7)       *Indicators of hydrophytic vegotation and wight of page (for beserved):         periotic functionary (for beserved):       Prevent (S3)       Statiant (S1)       Statiant (S1)         Surface Water (A1)       Aquake Fauna (S13)       Statiant (S14)       Drainage Patterns (S10)         Surface Water (A1)       Aquake Fauna (S13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                         | %              |                |                    |                    | Loc**        | Textu          | re            | Remarks                  | _           |
| Below         Participation           pre: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.         **Location: PL = Poro Lining, M = I           hydric Soil Indicators:         Indicators for Problematic Hydric Soils;           Histic Epipedon (A2)         Sandy Redox (S5)         Dark Surface (S7) (LRR K, L)           Bekek Histic (A3)         Stripped Matrix (S6)         Cast Prairie Redox (A16) (LRR K, L)           Hydric Soil Indicators:         Indicators for Problematic Hydric Soils;           Hydrigen Sulfide (A4)         Learny Glogy Matrix (F2)         Very Shaltow Dark Surface (S7) (LRR K, L)           Stratified Layers (A5)         Learny Glogy Matrix (F3)         Other (explain in remarks)           Depleted Bodw Dark Surface (A11)         Redox Depressions (F8)         Thickators of hydrophydic wegetalion and winder the subject property consists of potentifally contaminated soils and were not sampled. Soils are assumed to burydric based on geomorphic position, hydrology and vegetalion.           YDROLOGY         Standuration (A1)         Aquabe Fauna (B13)         Durinage Patterns (B14)           Surface (A2)         Q presence of Reduced Interaction (C4)         Darinage Patterns (B10)           Surface (A12)         Cayable Fauna (B13)         Surface ACI cayas (B2)           price (C5)         Crash (C4)         Darinage Patterns (B10)           Surface Xater Coraves         Surface ACI cayas (B2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  | See                     |                |                | 1.                 | 1                  |              |                |               |                          |             |
| Below         Participation           pre: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.         **Location: PL = Poro Lining, M = I           hydric Soil Indicators:         Indicators for Problematic Hydric Soils;           Histic Epipedon (A2)         Sandy Redox (S5)         Dark Surface (S7) (LRR K, L)           Bekek Histic (A3)         Stripped Matrix (S6)         Cast Prairie Redox (A16) (LRR K, L)           Hydric Soil Indicators:         Indicators for Problematic Hydric Soils;           Hydrigen Sulfide (A4)         Learny Glogy Matrix (F2)         Very Shaltow Dark Surface (S7) (LRR K, L)           Stratified Layers (A5)         Learny Glogy Matrix (F3)         Other (explain in remarks)           Depleted Bodw Dark Surface (A11)         Redox Depressions (F8)         Thickators of hydrophydic wegetalion and winder the subject property consists of potentifally contaminated soils and were not sampled. Soils are assumed to burydric based on geomorphic position, hydrology and vegetalion.           YDROLOGY         Standuration (A1)         Aquabe Fauna (B13)         Durinage Patterns (B14)           Surface (A2)         Q presence of Reduced Interaction (C4)         Darinage Patterns (B10)           Surface (A12)         Cayable Fauna (B13)         Surface ACI cayas (B2)           price (C5)         Crash (C4)         Darinage Patterns (B10)           Surface Xater Coraves         Surface ACI cayas (B2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  | Remarks                 | 1              |                |                    |                    |              |                |               |                          |             |
| rpc: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Crains.       **Location: PL = Poro Lining, M = 1         rpc: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Crains.       **Location: PL = Poro Lining, M = 1         rpc: C = Concentration, D = Depletion, RM = Reduced Matrix, (S4)       Coast Praine Redox (A16) (LRR K, L, R)         Histie Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L,         Histie Epipedon (A2)       Sandy Redox (S5)       Coast Praine Redox (A16) (LRR K, L,         Statified Layers (A6)       Loarny Mucky Menral (F1)       Iron-Manganese Masses (F12) (LRR K, L,         Statified Layers (A6)       Loarny Mucky Menral (F2)       Very Shallow Dark Surface (T12)         2 cm Muck (A10)       Depleted Matrix (F2)       Very Shallow Dark Surface (T12)         Statified Layers (A6)       Loarny Mucky Menral (F3)       **         Statified Layers (A6)       Redox Depressions (F8)       **         Thick Dark Surface (A12)       Redox Depressions (F8)       **         strictive Layer (if observed):       Prepieted Matrix (S1       Secondary Indicators Imminum of two in Surface Values (S10)         Strade Value Layer (if observed):       Presence of Reduced rom (C13)       Surface Values (S10)         Strade Value (A11)       Aquata E Jama (S13)       Surface Sol Cracks (E8)         Surface Value (A1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                         | <u>}</u> ──_{─ |                | +                  | <u> </u>           | <u>  </u>    |                |               |                          |             |
| ge: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M = Indicators for Problematic Hydric Soils:         Histel C Fipedon (A2)       Sandy Gleyed Matrix (S4)       Indicators for Problematic Hydric Soils:         Histel C Fipedon (A2)       Sandy Redox (S5)       Daix Surface (S7) (LRR K, L, R)         Black Histe (A3)       Stripped Matrix (S4)       Coast Praine Redox (A16) (LRR K, L, R)         Black Histe (A3)       Stripped Matrix (S5)       5 om Mucky Peat or Peat (S3) (LRR K, L, R)         Depleted Below Dark Surface (A11)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A12)       Depleted Matrix (F3)       Other (explain in remarks)         Bady Mucky Mineral (S1)       Redox Dark Surface (F7)       *Indicators of hydrophydio vegetation and with hydrology must be present, unless disturbe for Mydroly Peat or Peat (S3)         strictive Layer (if observed):       problematic       Hydric soil present?       Y         prict (incres):       mary Indicators for Indicators:       mary Indicators:       Mydrology and vegetation.         Surface Water (A1)       Aquelo Fauna (B13)       Surface Soil Cracks (B6)       Surface Soil Cracks (B6)         Surface Water (A1)       Aquelo Fauna (B13)       Surface Soil Cracks (B6)       Surface Soil Cracks (B6)         Surface (B3)       (C3)       Craptin Burrow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  | Delow                   | {              |                | +                  |                    |              | <u>·</u>       |               |                          | <del></del> |
| pe: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M = Idy Cocation: PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Lining, PL = Pore Pore Lining, PL = Pore Pore Lining, PL = Pore Pore Lining, PL = Pore Pore Lining, PL = Pore Pore Lining, PL = Pore Pore Pore Lining, PL = Pore Pore Lining, PL = Pore P |                  | ·                       | ┟╍╍╌┥╍         |                | ╉━━                |                    |              |                |               |                          |             |
| pe: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       **Location: PL = Pore Lining, M = 1         tydric Soil Indicators:       Indicators for Problematic Hydric Soils:       Indicators for Problematic Hydric Soils:         Histic Epipedin (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 cm Mucky Peat or Peat (S3) (LRR K, L, R)         Stratified Layers (A5)       Loarry Mucky Mineral (F1)       tron-Mangamese Masses (F2) (LRR K, L)         Depleted Belw Dark Surface (A11)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Belw Dark Surface (A11)       Depleted Matrix (F3)       Other (explain in remarks)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)       *Indicators of hydrophydio vegetation and with hydrology must be present, unless disturbe for Mucky Peat or Peat (S3)         strictive Layer (if observed):       problematic       Hydric soil present?       Y         prit (inches):       marks:       Hydrology Indicators:       mary Indicators (Infinuum of one is required; check all that apply)       Secondary Indicators (minuum of two)         Surface Water (A1)       Aquelo Fauna (B13)       Surface Soil Cracks (B6)       Dalaege Patiens (D10)         Surface Water (A1)       Aquelo Fauna (B13)       Surface Soil Cracks (B6)       Dalaege Patiens (D10)         Surfa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                         | ╞╴╶┼┈          |                |                    |                    | ╡            |                |               |                          |             |
| pe: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       **Location: PL = Pore Lining, M = 1         tydric Soil Indicators:       Indicators for Problematic Hydric Soils:       Indicators for Problematic Hydric Soils:         Histic Epipedin (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 cm Mucky Peat or Peat (S3) (LRR K, L, R)         Stratified Layers (A5)       Loarry Mucky Mineral (F1)       tron-Mangamese Masses (F2) (LRR K, L)         Depleted Belw Dark Surface (A11)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Belw Dark Surface (A11)       Depleted Matrix (F3)       Other (explain in remarks)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)       *Indicators of hydrophydio vegetation and with hydrology must be present, unless disturbe for Mucky Peat or Peat (S3)         strictive Layer (if observed):       problematic       Hydric soil present?       Y         prit (inches):       marks:       Hydrology Indicators:       mary Indicators (Infinuum of one is required; check all that apply)       Secondary Indicators (minuum of two)         Surface Water (A1)       Aquelo Fauna (B13)       Surface Soil Cracks (B6)       Dalaege Patiens (D10)         Surface Water (A1)       Aquelo Fauna (B13)       Surface Soil Cracks (B6)       Dalaege Patiens (D10)         Surfa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                         | ╏╾╍╌┟╴         |                | ┦────              | ļ                  |              |                |               |                          |             |
| Hydric Soll Indicators:       Indicators for Problematic Hydric Solls:         Histice Epipedon (A2)       Sandy Gleyed Matrix (S4)       Coast Praine Redox (A16) (LRR K, L, R)         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peat or Peat (S3) (LRR K, L)         Stratified Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (F12) (LRR K, L)         Depleted Matrix (F3)       Depleted Matrix (F2)       Other (explain in remarks)         Depleted Matrix (F3)       Depleted Matrix (F2)       Present, unless disturbs         Sandy Mucky Mineral (S1)       Redox Dark Surface (F7)       Indicators of hydrophytic vegetation and we hydrology must be present, unless disturbs         prix (incres):       matrixs:       Hydric soil present?       Y         pt (incres):       Hydric soil present?       Y         marks:       Secondary Indicators:       Secondary Indicators       Secondary Indicators         mary Indicators (B1)       Aquatic Found R13)       Surface Soil Cracks (B6)         Settime R1       Coxidized Rhizospheres on Living Roots       Crayfish Burrows (C6)         Settime Deposits (B2)       (C3)       X Saturation Visible on Aerial Imager         pt (incres):       Turue Aquatic Fauna (C1)       Secondary Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                         |                |                | <u> </u>           | <u> </u>           |              | <u>`</u>       |               |                          |             |
| Hydric Soll Indicators:       Indicators for Problematic Hydric Solls:         Histice Epipedon (A2)       Sandy Gleyed Matrix (S4)       Coast Praine Redox (A16) (LRR K, L, R)         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peat or Peat (S3) (LRR K, L)         Stratified Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (F12) (LRR K, L)         Depleted Matrix (F3)       Depleted Matrix (F2)       Other (explain in remarks)         Depleted Matrix (F3)       Depleted Matrix (F2)       Present, unless disturbs         Sandy Mucky Mineral (S1)       Redox Dark Surface (F7)       Indicators of hydrophytic vegetation and we hydrology must be present, unless disturbs         prix (incres):       matrixs:       Hydric soil present?       Y         pt (incres):       Hydric soil present?       Y         marks:       Secondary Indicators:       Secondary Indicators       Secondary Indicators         mary Indicators (B1)       Aquatic Found R13)       Surface Soil Cracks (B6)         Settime R1       Coxidized Rhizospheres on Living Roots       Crayfish Burrows (C6)         Settime Deposits (B2)       (C3)       X Saturation Visible on Aerial Imager         pt (incres):       Turue Aquatic Fauna (C1)       Secondary Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  | -                       |                |                |                    |                    |              | _              |               |                          |             |
| Histisol (A1)       Sandy Gleyed Matrix (S4)       Coast Prairie Redox (A16) (LRR K, L, R)         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (C1) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 om Mucky Peat or Peat (S3) (LRR K, L, R)         Hydrogen Sulfde (A4)       Loamy Mucky Mineral (F1)       Iron-Manganese Masses (F12) (LRR K, L, R)         Depieted Below Dark Surface (A10)       Depieted Matrix (F2)       Very Shallow Dark Surface (TF12)         Depieted Below Dark Surface (A11)       Redox Dark Surface (F7)       Indicators of hydrophytic vegetation and wn hydrology must be present, unless disturbe prosent, unless disturbe proteinatic         Strictive Layer (if observed):       Peinter (F1)       Iron-Manganese Masses (F12)       Proteinatic         pith (inches):       marks:       Hydric soil present?       Y         marks:       Free subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be yordire based on geomorphic position, hydrology and vegetation.       Secondary Indicators: (minimum of two in Surface Soil Cracks (86)         High Water Table (A2)       X True Aquatic Plants (B14)       Drainage Patiens (B10)       Saturation Visio on Areal Imager, (C2)         Saturation (A3)       Hydrogen Suffide Cotor (C1)       Dry Sease Niker Table (C2)       Cracks (B6)         High Water Table (B3)       Cracks (B4)       Crasina Burows (C3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | pe: C = 0        | Concentration, D        | = Depletior    | , RM = Redu    | ed Matri           | x, MS = N          | Aasked Sa    | and Grains.    | **Location    | : PL = Pore Lining, M    | = Matr      |
| Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L)         Black Histic (A3)       Stripped Matrix (S6)       5 om Mucky Peat or Peat (S3) (LRR K, L,         Hydrogen Suffde (A4)       Loarny Gleyed Matrix (F2)       Very Shallow Dark Surface (F12) (LRR K, L,         Stradified Layers (A5)       Loarny Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F2)       Very Shallow Dark Surface (TF12)         Thick Dark Surface (A12)       Depleted Matrix (F2)       'Indicators of hydrophytic vegetation and with surface (F7)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)       'Indicators of hydrophytic vegetation and with hydrology must be present, unless disturbe problematic         strictive Layer (if observed):       Period Dark Surface (F7)       'Indicators of hydrophytic vegetation and with hydrology nust be present?       Y         pth (inches):       Presenved):       Period Dark Surface (F7)       'Indicators (F8)         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to bright based on geomorphilo position, hydrology and vegetation.       Secondary Indicators (minimum of two)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (66)       Drainage Patterns (610)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (66)       Drain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | lydric So        | il Indicators:          |                | · .            |                    |                    |              | Indicator      | s for Proble  | matic Hydric Soils:      |             |
| Black Histic (A3)       Stripped Matrix (S6)       5 cm Mucky Peat or Peat (S3) (LRR K, L,         Hydrogen Sulfide (A4)       Loarny Mucky Mineral (F1)       Iron-Mangamese Masses (F12) (LRR K, L,         Stratified Layers (A5)       Loarny Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F2)       Very Shallow Dark Surface (TF12)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F7)       *Indicators of hydrophytic vegetation and wn hydrology must be present, unless disturbe 5 cm Mucky Peat or Peat (S3)         S rom Mucky Peat or Peat (S3)       Redox Depressions (F8)       *Indicators of hydrophytic vegetation and wn hydrology must be present, unless disturbe problematic         strictive Layer (if observed):       +       Hydric soil present?       Y         pith (inches):       -       Hydric soil present?       Y         pith (inches):       -       -       -       -         file subject property consists of potentially contarminated soils and were not sampled. Soils are assumed to brydric based on geomorphic position, hydrology and vegetation.       -       -       -         file was a mark s::       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <t< td=""><td>His</td><td>tisol (A1)</td><td>,</td><td>Sa</td><td>ndy Gley</td><td>ed Matrix</td><td>(S4)</td><td>Coas</td><td>t Prairie Red</td><td>ox (A16) (LRR K, L, R</td><td>2)</td></t<>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | His              | tisol (A1)              | ,              | Sa             | ndy Gley           | ed Matrix          | (S4)         | Coas           | t Prairie Red | ox (A16) (LRR K, L, R    | 2)          |
| Hydrogen Sulfide (A4)       Loamy Mucky Mineral (F1)       Iron-Manganese Masses (F12) (LRR K, L,         Statilied Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F7)       *Indicators of hydrophytic vegetation and with hydrology must be present, unless disturbe problematic         S cm Mucky Mineral (S1)       Redox Depressions (F8)       *Indicators of hydrophytic vegetation and with hydrology must be present, unless disturbe problematic         strictive Layer (if observed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | His              | tic Epipedon (A2)       | )              | Sa             | indy Red           | ox (S5)            |              | Dark           | Surface (S7)  | (LRR K, L)               |             |
| Stratified Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F7)       *Indicators of hydrophytic vegetation and wn hydrology must be present, unless disturber         S cm Mucky Peat or Peat (S3)       Problematic       *Indicators of hydrophytic vegetation and wn hydrology must be present, unless disturber         strictive Layer (if observed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Bla              | ck Histic (A3)          |                | St             | ripped Ma          | atrix (S6)         |              | <br>5 cm       | Mucky Peat    | or Peat (S3) (LRR K,     | L, R)       |
| 2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A12)       Depleted Dark Surface (F7)       *Indicators of hydrophytic vegetation and we hydrology must be present, unless disturbe structure. Lunless disturbe problematic         Sandy Mucky Mineral (S1)       Redox Depressions (F8)       *Indicators of hydrophytic vegetation and we hydrology must be present, unless disturbe problematic         Strictive Layer (if observed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Hyo              | Irogen Sulfide (A       | 4)             | Lo             | amy Muc            | ky Miner           | al (F1)      | Iron-I         | /anganese N   | Aasses (F12) (LRR K,     | , L, R)     |
| Depleted Below Dark Surface (A11)       Redox Dark Surface (F5)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)         Sandy Mucky Mineral (S1)       Redox Depressions (F8)         'Indicators of hydrophytic vegetation and we hydrology must be present, unless disturbe problematic         strictive Layer (if observed):         pe:         ph (inches):         marks:         The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric based on geomorphic position, hydrology and vegetation.         //DROLOGY         strate finite (A2)       X         Surface Water (A1)       Aquatic Fauna (B13)         Surface Water (A1)       Aquatic Fauna (B13)         Surface Water (A1)       Aquatic Fauna (B13)         Surface (B1)       Oxidized Rhizospheres on Living Roots         Sediment Deposits (B3)       Presence of Reduced Iron (C4)         Stunded or Surface (B4)       Recent Iron Reduction in Tilled Soils         Jord Posestration       Gauge or Well Data (D9)         Water Marks (B4)       Check Surface (C7)         Solared Viegetated Conceve Surface (B4)       Gauge or Well Data (D9)         Water Marks (B5)       (C6)         Inindation Visible on Areial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vege                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Stra             | atified Layers (A5      | )              | Lo             | amy Gley           | ed Matrix          | x (F2)       | Very           | Shallow Dark  | c Surface (TF12)         |             |
| Thick Dark Surface (A12)       Depleted Dark Surface (F7)       *Indicators of hydrophytic vegetation and with hydrology must be present, unless disturbe problematic         Sen Mucky Peat or Peat (S3)       *Indicators of hydrophytic vegetation and with hydrology must be present, unless disturbe problematic         strictive Layer (if observed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2 ci             | n Muck (A10)            |                | <br>De         | pleted M           | latrix (F3)        | )            | Other          | explain in c  | emarks)                  |             |
| Sandy Mucky Mineral (S1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Dej              | leted Below Dar         | k Surface (J   | A11) Re        | dox Dark           | surface            | (F6)         | · .            | •             | ·                        |             |
| Sandy Mucky Mineral (S1)       Redox Depressions (F8)       hydrology must be present, unless disturbe problematic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Thi              | ck Dark Surface (       | (A12)          | De             | pleted D           | ark Surfa          | ce (F7)      | *1- 1100       | have of huden |                          |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  | ndy Mucky Minera        | al (S1)        | Re             | dox Dep            | ressions           | (F8)         |                |               |                          |             |
| strictive Layer (if observed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  | m Mucky Peat or         | Peat (S3)      |                |                    |                    | • •          | njaro          |               |                          | 1000 0      |
| be:       Hydric soil present?       Y         pth (inches):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | strictive        | Laver (if observ        | ed):           |                |                    |                    | T            |                |               |                          |             |
| spth (inches):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                         |                |                |                    |                    | 1            | Hydric         | soil present  | 7 Y                      |             |
| The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric based on geomorphic position, hydrology and vegetation.         YDROLOGY         ettand Hydrology Indicators:         imary Indicators (minimum of one is required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  | es):                    |                |                |                    | -                  | [            | •              | •             |                          |             |
| The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric based on geomorphic position, hydrology and vegetation.         YDROLOGY         ettand Hydrology Indicators:         imary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two is surface Soil Cracks (B6)         High Water Table (A2)       X       True Aquatic Flants (B14)       Drainage Patterns (B10)         C Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X Saturation Visible on Aerial Imagery         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Agal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Caeomorphic Position (D2)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (39)       Other (Explain in Remarks)       Wetland       hydrology y present?         Ield Observations:       Yes       No       Depth (inches):       mydrology y present?       Y         Includes capillary finge)       No       Depth (inches):       surface       prese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | emarks:          |                         |                |                |                    |                    | <u> </u>     | ·              |               |                          |             |
| fetfand Hydrology Indicators:         strinary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two is required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       X       True Aquatic Flants (B14)       Drainage Patterns (B10)         K       Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X       Saturation Visible on Aerial Imagery         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Agal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)       Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)       Water (Explain in Remarks)       Wetland         Ield Observations:       Yes       No       X       Depth (inches):       Yes         urface water present?       Yes       No       Depth (inches):       surface       Ye                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                         |                |                |                    |                    |              | were not sa    | mpled. So     | ils are assumed to       | be          |
| timary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two is required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Crecks (B6)         High Water Table (A2)       X       True Aquatic Plants (B14)       Drainage Patterns (B10)         K Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X       Saturation Visible on Aerial Imagery         Drift Deposits (B5)       (C6)       Face-neutron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Inon Deposits (B5)       (C6)       FAC-Neutral Test (D5)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water table present?       Yes       No       X       Depth (inches):       Wetland         Vater table present?       Yes       No       X       Depth (inches):       present?       Y         ield Observations:       Yes       No       X       Depth (inches):       present?       Y         vater table present?       Yes       No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | YDROL            | DGY                     |                | ·              |                    |                    |              |                |               |                          | _           |
| Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       X       True Aquatic Plants (B14)       Drainage Pattems (B10)         ( Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X       Saturation Visible on Aerial Imagery         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)       Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)       Wetland In Remarks)       Wetland         Ield Observations:       Water Table present?       Yes       No       X       Depth (inches):       mersent?       Yes         Autration present?       Yes       No       X       Depth (inches):       mersent?       Yes         escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:       Present?       Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | etland Hy        | drology Indicate        | ors:           |                |                    |                    | •            |                |               |                          |             |
| High Water Table (A2)       X       True Aquatic Plants (B14)       Drainage Pattems (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X       Saturation Visible on Aerial Imagery         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stanted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (59)       Other (Explain in Remarks)       Wetland       hydrology         eld Observations:       Ves       No       X       Depth (inches):       yresent?         vaturation present?       Yes       No       X       Depth (inches):       yresent?       Y         reduces capillary fringe)       escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:       Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <u>imary Ind</u> | icators (minimum        | of one is re   | equired; check | <u>call that a</u> | (ylage             |              | Se             | condary Indi  | cators (minimum of tw    | /o regu     |
| Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X Saturation Visible on Aerial Imagery         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)         Gauge or Well Data (D9)       Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Wetland       hydrology         urface water present?       Yes       No       Depth (inches):       wetland         ater table present?       Yes       No       Depth (inches):       present?       Y         aturation present?       Yes       No       Depth (inches):       surface       present?       Y         escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Surface          | Water (A1)              |                |                | Aquatio            | <b>; F</b> auna (E | 313)         | -              | Surface S     | oil Cracks (B6)          |             |
| Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       X       Saturation Visible on Aerial Imagery         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       FAC-Neutral Test (D5)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)       Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Ifface water present?       Yes       No       X       Depth (inches):       Mydrology         aturation present?       Yes       No       Depth (inches):       surface       present?       Y         escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:       Y       Surface       Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | _High W          | ater Table (A2)         |                | >              | C True Ad          | quatic Pla         | nts (B14)    |                | Drainage      | Patlems (B10)            |             |
| Sediment Deposits (B2)      (C3)       X       Saturation Visible on Aerial Imagery         Drift Deposits (B3)      Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)      C6)      FAC-Neutral Test (D5)      FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)      Thin Muck Surface (C7)      FAC-Neutral Test (D5)      FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)      Thin Muck Surface (C7)      FAC-Neutral Test (D5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Saturati         | on (A3)                 |                | _              | Hydrog             | en Sulfide         | Odor (C1     | ) _            | Dry-Seas      | on Water Table (C2)      |             |
| Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       FAC-Neutral Test (D5)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)       Vater-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Yes       No       X       Depth (inches):       Wetland         ater table present?       Yes       No       X       Depth (inches):       yrace         aturation present?       Yes       X       No       Depth (inches):       yresent?       Y         activation present?       Yes       X       No       Depth (inches):       yresent?       Y         activation present?       Yes       X       No       Depth (inches):       surface       yresent?       Y         activation present?       Yes       X       No       Depth (inches):       surface       yresent?       Y         activation present?       Yes       X       No       Depth (inches):       surface       present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Water N          | larks (81)              |                |                | Oxidize            | d Rhizos           | pheres on I  | Living Roots   | Crayfish E    | 3urrows (C8)             |             |
| Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       X       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (59)       Other (Explain in Remarks)         eld Observations:       Yes         urface water present?       Yes         No       X       Depth (inches):         aturation present?       Yes         No       Depth (inches):         startation present?       Yes         scribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available: <td>Sedime</td> <td>nt Deposits (B2)</td> <td></td> <td>_</td> <td>_(C3)</td> <td></td> <td></td> <td>-</td> <td>X Saturation</td> <td>i Visible on Aerial Imag</td> <td>ery (CS</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Sedime           | nt Deposits (B2)        |                | _              | _(C3)              |                    |              | -              | X Saturation  | i Visible on Aerial Imag | ery (CS     |
| Iron Deposits (B5)      (C6)      FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | _ Drift De       | posits (B3)             |                |                | Presen             | ce of Red          | uced iron    | (C4)           | Stunted o     | r Stressed Plants (D1)   |             |
| Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (59)       Other (Explain in Remarks)         eld Observations:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Algal M          | at or Crust (B4)        |                |                | Recent             | Iron Red           | uction in Ti | illed Soils    | X Geomorp     | hic Position (D2)        |             |
| Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Inface water present?         urface water present?       Yes         No       X       Depth (inches):         Vater table present?       Yes         No       X       Depth (inches):         aturation present?       Yes         Yes       X         No       Depth (inches):         surface       present?         Yes       X         No       Depth (inches):         surface       present?         Yes       X         No       Depth (inches):         surface       present?         Y       cludes capillary fringe)         escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Iron De          | posits (B5)             |                |                | (66)               |                    |              |                | FAC-Neu       | tral Test (D5)           |             |
| Water-Stained Leaves (59)       Other (Explain in Remarks)         eld Observations:       urface water present?       Yes       No       X       Depth (inches):       Wetland         vater table present?       Yes       No       X       Depth (inches):       hydrology         aturation present?       Yes       X       No       Depth (inches):       surface       present?       Y         aturation present?       Yes       X       No       Depth (inches):       surface       present?       Y         ncludes capillary fringe)       escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Inundat          | ion Visible on Aeri     | al Imagery (   | B7)            | Thin M             | uck Surfa          | ce (C7)      |                | <u> </u>      |                          |             |
| eld Observations:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sparsel          | y Vegetated Conc        | ave Surface    | (B8)           | Gauge              | or Well D          | ata (D9)     |                |               |                          |             |
| Autrace water present?       Yes       No       X       Depth (inches):       Wetland         Vater table present?       Yes       No       X       Depth (inches):       Image: Comparison of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec                                                                                                            | Water-8          | Stained Leaves (B       | 9)             |                | Other (            | Explain in         | Remarks      | ) .            |               |                          |             |
| Value       Yes       No       X       Depth (inches):       Image: Model of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the                                     | eld Obse         | rvations:               | <u> </u>       |                |                    |                    |              |                |               |                          |             |
| aturation present?       Yes       X       No       Depth (inches):       surface       present?       Y         includes capillary fringe)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                         |                |                |                    | ·                  | • •          |                |               |                          |             |
| ncludes capillary fringe)<br>escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                         |                |                | <u> </u>           |                    |              |                |               |                          |             |
| escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                         | res _          | <u> </u>       |                    | -Debru             | (inches):    | surrace        | pres          |                          |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  | - and the second second |                | monitorind W   | ell aerial         | nhofos             | nrevious i   | nenections) if | available:    | <u> </u>                 |             |
| emarks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | escine ie        |                         | sam gauge,     | , monitoring w | GII, 001101        | Priotoa,           | providus i   | napeodona), n  | avanaure.     |                          |             |
| emarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                         |                |                | _                  |                    |              |                |               |                          |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | emarks:          |                         |                |                |                    |                    |              |                |               |                          |             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                  |                         |                |                |                    |                    |              |                |               |                          |             |

## WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                                | City/C   | County:       | Waukegan/L     | ake Sampling Date: 5-2-12                                                                            |
|----------------------------------------------------------------|----------|---------------|----------------|------------------------------------------------------------------------------------------------------|
| Applicant/Owner: NSG                                           | -        | State:        | lilinois       | s Sampling Point; 4                                                                                  |
| Investigator(s): Hey and Associates (Kuykendall/Mosca)         |          | Sectio        | on, Township   | , Range: S 15, T 45N, R 12E                                                                          |
| Landform (hillslope, terrace, etc.):                           |          | Local re      | elief (concave | e, convex, none):none                                                                                |
| Slope (%): Lat: 42.373989                                      |          | Long:         | -87.82340      | 6 Datum:                                                                                             |
| Soil Map Unit Name 802B loamy                                  |          |               | √WI C          | lassification:                                                                                       |
| Are climatic/hydrologic conditions of the site typical for thi | s time o | f the year?   | Y (If          | no, explain in remarks)                                                                              |
| Are vegetation Y, soil Y, or hydrology                         | Y        | significantly | disturbed?     | Are "normal circumstances"                                                                           |
| Are vegetation , soil , or hydrology                           | ,        | naturally pr  | oblematic?     | present? N                                                                                           |
| SUMMARY OF FINDINGS                                            |          |               |                | (If needed, explain any answers in remarks.)                                                         |
| Hydrophytic vegetation present? Y                              |          |               |                |                                                                                                      |
| Hydric soil present? Y                                         |          | is the s      | ampled area    | within a wetlan N                                                                                    |
| Wetland hydrology present? N                                   |          | f yes, op     | tional wetlan  | d site ID:                                                                                           |
| Remarks: (Explain alternative procedures here or in a se       | l        | eport)        |                |                                                                                                      |
| The subject property is a former manufactured gas              |          |               | eroone vario   | is staces of investigation, construction, and                                                        |
| remediation in the past. The property                          |          |               |                |                                                                                                      |
| VEGETATION Use scientific names of plants.                     |          |               |                | · ····································                                                               |
|                                                                | bsolute  | Dominan       | Indicator      | Dominance Test Worksheet                                                                             |
|                                                                |          | t Species     | Staus          | Number of Dominant Species                                                                           |
| 1 Populus deltoides                                            | 30       | Y             | FAC            | that are OBL, FACW, or FAC: 3 (A)                                                                    |
| 2 Robinia pseudoacacia                                         | 10       | Y             | FACU           | Total Number of Dominant                                                                             |
| 3                                                              |          |               |                | Species Across all Strata: 6 (B)                                                                     |
| 4                                                              |          |               |                | Percent of Dominant Species                                                                          |
| 5                                                              |          | <u> </u>      |                | that are OBL, FACW, or FAC: <u>50.00%</u> (A/B)                                                      |
| Configure (D) to be a                                          | 40       | = Total Cove  | IT I           | Prevalence Index Worksheet                                                                           |
| Sapling/Shrub stratun (Plot size:) 1 Rhamnus cathartica        | 20       | Y             | FACU           | Total % Cover of;                                                                                    |
| 2 Rhamnus frangula                                             | 20       | ·<br>Y        | FAC            | OBL species 0 x1 ≈ 0                                                                                 |
| 3 Comus stolonifera                                            | 20       | ·             | FACW           | FACW species 20 $x 2 = 40$                                                                           |
| 4 Lonicera tatarica                                            | 20       | Y             | FACU           | FAC species $50 \times 3 = 150$                                                                      |
| 5                                                              |          | · •           |                | FACU species 50 x 4 = 200                                                                            |
|                                                                | 80       | = Total Cove  | ог             | UPL species 0 x 5 = 0                                                                                |
| Herb stratum (Plot size:)                                      |          | •             |                | Column totals 120 (A) 390 (B)                                                                        |
| 1                                                              |          | - <u></u>     |                | Prevalence Index = B/A = 3.25                                                                        |
| 2                                                              |          |               |                |                                                                                                      |
| 3                                                              |          | ·             |                | Hydrophytic Vegetation Indicators:                                                                   |
| 4                                                              | · ·      |               |                | Rapid test for hydrophytic vegetation                                                                |
| 5                                                              |          |               |                | Dominance test is >50%                                                                               |
| 6                                                              |          | •             |                | Prevalence index is ≤3.0*                                                                            |
| 8                                                              |          | ·             |                | Morphogical adaptations* (provide                                                                    |
| 9                                                              |          |               |                | supporting data in Remarks or on a separate sheet)                                                   |
| 10                                                             |          |               |                | Problematic hydrophytic vegetation*                                                                  |
|                                                                | 0        | = Total Cove  |                | (explain)                                                                                            |
| Woody vine stratum (Plot size:)                                |          | -             |                | *Indicators of hydric soil and wettand hydrology must be<br>present, unless disturbed or problematic |
| 2                                                              |          | •             |                | Hydrophytic                                                                                          |
|                                                                | 0        | = Total Cov   |                | vegetation                                                                                           |
|                                                                |          |               |                | present? N                                                                                           |
| Remarks: (Include photo numbers here or on a separate          | e sheet) |               |                |                                                                                                      |

| )anth                                                                                                                                                                                                                                         | Matrix                                                                                                                                                                                                                                                                                                                                                 |                                                    | le depui                               |           | lox Feat                                                                                                                            |                                                                                                                                                       |                                                                                                                                                        | or confirm t                  |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Depth<br>(Inches)                                                                                                                                                                                                                             | Color (moist)                                                                                                                                                                                                                                                                                                                                          | %                                                  | Color                                  | (moist)   | <u>%</u>                                                                                                                            | Type*                                                                                                                                                 | Loc**                                                                                                                                                  | Textu                         | re                                                                                                                                    | Remarks                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                               | See                                                                                                                                                                                                                                                                                                                                                    | 1.,                                                | <u> </u>                               | · · ·     |                                                                                                                                     |                                                                                                                                                       |                                                                                                                                                        |                               | · ·                                                                                                                                   | ······································                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                               | Remarks                                                                                                                                                                                                                                                                                                                                                | +                                                  |                                        |           |                                                                                                                                     |                                                                                                                                                       | <u> </u>                                                                                                                                               |                               | <u> </u>                                                                                                                              | <u></u>                                                                                                                                                                                                                                                           |
| <u> </u>                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                        |                                                    | <u> </u>                               |           |                                                                                                                                     |                                                                                                                                                       | ╁───┟╸                                                                                                                                                 |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
| <u> </u>                                                                                                                                                                                                                                      | Below                                                                                                                                                                                                                                                                                                                                                  |                                                    | · · · ·                                |           |                                                                                                                                     |                                                                                                                                                       | ┼╾╍┼                                                                                                                                                   |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               | <u> </u>                                                                                                                                                                                                                                                                                                                                               | ₋                                                  |                                        |           |                                                                                                                                     |                                                                                                                                                       | +                                                                                                                                                      |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                        | <u> </u>                                           | <u> </u>                               |           |                                                                                                                                     |                                                                                                                                                       |                                                                                                                                                        |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                        |                                                    | <u> </u>                               |           |                                                                                                                                     | ļ                                                                                                                                                     |                                                                                                                                                        | •                             |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                        | 1_                                                 | ł. "                                   |           |                                                                                                                                     |                                                                                                                                                       |                                                                                                                                                        |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                        | T                                                  |                                        |           |                                                                                                                                     |                                                                                                                                                       |                                                                                                                                                        |                               | •                                                                                                                                     |                                                                                                                                                                                                                                                                   |
| vpe: C ≂ (                                                                                                                                                                                                                                    | Concentration, D                                                                                                                                                                                                                                                                                                                                       | = Deplet                                           | ion, RM                                | = Reduc   | ed Matrix                                                                                                                           | ( MS = I                                                                                                                                              | Masked Sa                                                                                                                                              | nd Grains.                    | **Location                                                                                                                            | n: PL = Pore Lining, M = Matrix                                                                                                                                                                                                                                   |
| · · · · ·                                                                                                                                                                                                                                     | oil Indicators:                                                                                                                                                                                                                                                                                                                                        |                                                    |                                        |           |                                                                                                                                     |                                                                                                                                                       |                                                                                                                                                        |                               |                                                                                                                                       | matic Hydric Soils:                                                                                                                                                                                                                                               |
| -                                                                                                                                                                                                                                             | tisol (A1)                                                                                                                                                                                                                                                                                                                                             |                                                    |                                        | Sar       | ndy Gley                                                                                                                            | ed Matri                                                                                                                                              | x (S4)                                                                                                                                                 |                               |                                                                                                                                       | iox (A16) (LRR K, L, R)                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                               | tic Epipedon (A2                                                                                                                                                                                                                                                                                                                                       | 3                                                  |                                        |           | ndy Reda                                                                                                                            |                                                                                                                                                       | •••                                                                                                                                                    |                               |                                                                                                                                       | ) (LRR K, L)                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                        | <i>.</i> ,                                         |                                        |           | pped Ma                                                                                                                             |                                                                                                                                                       | )                                                                                                                                                      |                               | •                                                                                                                                     | or Peat (S3) (LRR K, L, R)                                                                                                                                                                                                                                        |
| Black Histic (A3)<br>Hydrogen Sulfide (A4)                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                        |                                                    |                                        |           | imy Muc                                                                                                                             |                                                                                                                                                       |                                                                                                                                                        |                               | -                                                                                                                                     | Masses (F12) (LRR K, L, R)                                                                                                                                                                                                                                        |
| _                                                                                                                                                                                                                                             | atified Layers (A                                                                                                                                                                                                                                                                                                                                      |                                                    |                                        |           | imy Gley                                                                                                                            | -                                                                                                                                                     |                                                                                                                                                        |                               | -                                                                                                                                     | k Surface (TF12)                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                               | m Muck (A10)                                                                                                                                                                                                                                                                                                                                           | -,                                                 |                                        |           | pleted M                                                                                                                            |                                                                                                                                                       | • •                                                                                                                                                    |                               | (explain in i                                                                                                                         | • •                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                               | pleted Below Da                                                                                                                                                                                                                                                                                                                                        | rk Surfac                                          | e (A11)                                |           | dox Dark                                                                                                                            |                                                                                                                                                       | -                                                                                                                                                      | <b>=</b>                      | (                                                                                                                                     |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               | ick Dark Surface                                                                                                                                                                                                                                                                                                                                       |                                                    |                                        |           |                                                                                                                                     |                                                                                                                                                       | ace (F7)                                                                                                                                               |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                               | ndy Mucky Miner                                                                                                                                                                                                                                                                                                                                        | • •                                                |                                        |           | dox Dep                                                                                                                             |                                                                                                                                                       |                                                                                                                                                        |                               |                                                                                                                                       | ophytic vegetation and weltand                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                               | m Mucky Peat or                                                                                                                                                                                                                                                                                                                                        | • •                                                | ۰.<br>۱                                |           |                                                                                                                                     |                                                                                                                                                       | (1.0)                                                                                                                                                  | nyaro                         |                                                                                                                                       | e present, unless disturbed or<br>problematic                                                                                                                                                                                                                     |
| strictive                                                                                                                                                                                                                                     | Layer (if observ                                                                                                                                                                                                                                                                                                                                       | ved).                                              |                                        |           |                                                                                                                                     |                                                                                                                                                       | 1 -                                                                                                                                                    |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
| epth (inch<br>emarks:                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                        |                                                    |                                        |           |                                                                                                                                     | -                                                                                                                                                     |                                                                                                                                                        |                               | soil present                                                                                                                          |                                                                                                                                                                                                                                                                   |
| epth (inch<br>emarks:<br>The sub                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                        | consists                                           | of pote                                | ntially c | ontami                                                                                                                              | nated s                                                                                                                                               | coils and v                                                                                                                                            |                               |                                                                                                                                       | ils are assumed to be                                                                                                                                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hyd <b>ric</b> .                                                                                                                                                                                          | ject property c                                                                                                                                                                                                                                                                                                                                        | consists                                           | of pote                                | ntially c | ontami                                                                                                                              | nated s                                                                                                                                               | coils and v                                                                                                                                            |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL                                                                                                                                                                                          | oject property c                                                                                                                                                                                                                                                                                                                                       |                                                    | of pote                                | ntially c | ontami                                                                                                                              | nated s                                                                                                                                               | coils and v                                                                                                                                            |                               |                                                                                                                                       |                                                                                                                                                                                                                                                                   |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy                                                                                                                                                                             | ject property c                                                                                                                                                                                                                                                                                                                                        | ors:                                               |                                        | -         |                                                                                                                                     |                                                                                                                                                       | oils and v                                                                                                                                             | vere not sa                   | mpled. So                                                                                                                             | ils are assumed to be                                                                                                                                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind                                                                                                                                                                | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun                                                                                                                                                                                                                                                                                       | ors:                                               |                                        | -         | all that a                                                                                                                          |                                                                                                                                                       |                                                                                                                                                        | vere not sa                   | mpled. So                                                                                                                             | ils are assumed to be                                                                                                                                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind                                                                                                                                                                | oject property c<br>OGY<br>ydrology Indicat                                                                                                                                                                                                                                                                                                            | ors:                                               |                                        | -         | all that a                                                                                                                          | apply)<br>Fauna (l                                                                                                                                    |                                                                                                                                                        | vere not sa                   | mpled. Sol                                                                                                                            | ils are assumed to be<br>icators (minimum of two requi                                                                                                                                                                                                            |
| pth (inch<br>marks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W                                                                                                                                             | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>water (A1)<br>later Table (A2)                                                                                                                                                                                                                                                     | ors:                                               |                                        | -         | <u>all that a</u><br>Aquatic<br>True Ac                                                                                             | apply)<br>Fauna (l<br>juatic Pla                                                                                                                      | B13)                                                                                                                                                   | were not sa<br><u>Se</u>      | mpled. So<br>condary Ind<br>Surface S                                                                                                 | ils are assumed to be<br>icators (minimum of two requin<br>Soil Cracks (B6)<br>Patterns (B10)                                                                                                                                                                     |
| pth (inch<br>marks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturat                                                                                                                                  | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>water (A1)<br>later Table (A2)<br>ion (A3)                                                                                                                                                                                                                                         | ors:                                               |                                        | -         | <u>all that a</u><br>Aquatic<br>True Ac<br>Hydrog                                                                                   | epply)<br>Fauna (l<br>uatic Pla<br>an Sulfide                                                                                                         | B13)<br>ants (B14)<br>e Odor (C1)                                                                                                                      | vere not sa<br><u>Se</u><br>- | mpled. Sol                                                                                                                            | ils are assumed to be<br>icators (minimum of two requin<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)                                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturati                                                                                                                               | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)                                                                                                                                                                                                                            | ors:                                               |                                        | -         | all that a<br>Aquatic<br>True Ac<br>Hydrog<br>Oxidize                                                                               | epply)<br>Fauna (l<br>uatic Pla<br>an Sulfide                                                                                                         | B13)<br>ants (B14)                                                                                                                                     | vere not sa<br><u>Se</u><br>- | condary Ind<br>Condary Ind<br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish                                                           | ils are assumed to be<br>icators (minimum of two requir<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)                                                                                                                             |
| Ppth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturati<br>Saturati<br>Sedime                                                                                                         | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>water (A1)<br>later Table (A2)<br>ion (A3)                                                                                                                                                                                                                                         | ors:                                               |                                        | -         | all that a<br>Aquatic<br>True Ac<br>Hydrog<br>Oxidize<br>(C3)                                                                       | apply)<br>Fauna (I<br>uatic Pla<br>en Sulfido<br>d Rhizos                                                                                             | B13)<br>ants (B14)<br>e Odor (C1)                                                                                                                      | vere not sa                   | condary Ind<br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio                                                             | ils are assumed to be<br>icators (minimum of two requin<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)                                                                                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturat<br>Saturat<br>Sedime<br>Drift De                                                                                               | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>water (A1)<br>later Table (A2)<br>ion (A3)<br>Warks (B1)<br>ent Deposits (B2)                                                                                                                                                                                                      | ors:                                               |                                        | -         | all that a<br>Aquatic<br>True Ac<br>Hydrog<br>Oxidize<br>(C3)<br>Presen                                                             | apply)<br>Fauna (I<br>juatic Pla<br>en Sulfidu<br>d Rhizos<br>ce of Rec                                                                               | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L<br>duced Iron (                                                                                       | were not sa                   | condary Ind<br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio<br>Sturted o                                                | ils are assumed to be<br>icators (minimum of two requin<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>n Visible on Aerial Imagery (C9)                                                                                         |
| Peth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturati<br>Water I<br>Sedime<br>Drift De<br>Algal M                                                                                   | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>e Water (A1)<br>later Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)                                                                                                                                                               | ors:                                               |                                        | -         | all that a<br>Aquatic<br>True Ac<br>Hydrogo<br>Oxidize<br>(C3)<br>Presen<br>Recent                                                  | apply)<br>Fauna (I<br>juatic Pla<br>en Sulfidu<br>d Rhizos<br>ce of Rec                                                                               | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L                                                                                                       | were not sa                   | mpled. Soi<br><u>condary Ind</u><br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio<br>Sáturatio<br>Stunted o              | ils are assumed to be<br><u>icators (minimum of two requin</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>In Visible on Aerial Imagery (C9)<br>or Stressed Plants (D1)<br>ohic Position (D2)                                |
| Peth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturati<br>Sedime<br>Drift De<br>Algal M<br>Iron De                                                                                   | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>e Water (A1)<br>later Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)                                                                                                                                                                                    | ors:<br>n of one i                                 | <u>s require</u>                       | -         | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)                                          | apply)<br>Fauna (I<br>juatic Pla<br>en Sulfidu<br>d Rhizos<br>ce of Rec                                                                               | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L<br>duced fron (<br>luction in Til                                                                     | were not sa                   | mpled. Soi<br><u>condary Ind</u><br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio<br>Sáturatio<br>Stunted o              | ils are assumed to be<br>icators (minimum of two requin<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>In Visible on Aerial Imagery (C9)<br>or Stressed Plants (D1)                                                             |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturati<br>Water I<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundal                                                             | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimum<br>e Water (A1)<br>later Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)                                                                                                                                                | iors:<br>n of one i                                | <u>s require</u><br>y (B7)             | -         | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)                                          | apply)<br>Fauna (I<br>uatic Pla<br>en Sulfide<br>d Rhizos<br>ce of Rec<br>lron Red<br>uck Surfa                                                       | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L<br>duced fron (<br>luction in Til                                                                     | were not sa                   | mpled. Soi<br><u>condary Ind</u><br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio<br>Sáturatio<br>Stunted o              | ils are assumed to be<br><u>icators (minimum of two requin</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>In Visible on Aerial Imagery (C9)<br>or Stressed Plants (D1)<br>ohic Position (D2)                                |
| Ppth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Ind<br>Surface<br>High W<br>Saturat<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparse                                                               | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>e Water (A1)<br>'ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>ion Visible on Aer                                                                                                                          | ial Imagel<br>cave Surfa                           | <u>s require</u><br>y (B7)             | -         | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin Mi<br>Gauge                      | apply)<br>Fauna (I<br>uatic Pla<br>an Sulfidd<br>d Rhizos<br>ce of Rec<br>lron Red<br>uck Surfa<br>or Well 1                                          | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L<br>duced Iron (<br>luction in Til<br>ace (C7)                                                         | Vere not sa                   | mpled. Soi<br><u>condary Ind</u><br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio<br>Sáturatio<br>Stunted o              | ils are assumed to be<br><u>icators (minimum of two requin</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>In Visible on Aerial Imagery (C9)<br>or Stressed Plants (D1)<br>ohic Position (D2)                                |
| epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>(etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Saturati<br>Unif De<br>Drift De<br>Inundat<br>Sparse<br>Water-                                                           | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>e Water (A1)<br>fater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>tion Visible on Aer<br>ly Vegetated Core                                                                                                    | ial Imagel<br>cave Surfa                           | <u>s require</u><br>y (B7)             | -         | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin Mi<br>Gauge                      | apply)<br>Fauna (I<br>uatic Pla<br>an Sulfidd<br>d Rhizos<br>ce of Rec<br>lron Red<br>uck Surfa<br>or Well 1                                          | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L<br>duced Iron (<br>duced Iron (<br>luction in Til<br>ace (C7)<br>Data (D9)                            | Vere not sa                   | mpled. Soi<br><u>condary Ind</u><br>Surface S<br>Drainage<br>Dry-Seas<br>Crayfish<br>Sáturatio<br>Sáturatio<br>Stunted o              | ils are assumed to be<br><u>icators (minimum of two requin</u><br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>In Visible on Aerial Imagery (C9)<br>or Stressed Plants (D1)<br>ohic Position (D2)                                |
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| hydric.<br>YDROL<br>/etland Hy<br>rimary Ind<br>Surface<br>High W<br>Saturati<br>Water I<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparse<br>Water-<br>ield Obse<br>Surface wa<br>Vater table<br>aturation                    | oject property c<br>OGY<br>ydrology Indicat<br>licators (minimun<br>e Water (A1)<br>ater Table (A2)<br>ion (A3)<br>Marks (B1)<br>ent Deposits (B2)<br>eposits (B3)<br>lat or Crust (B4)<br>posits (B5)<br>lion Visible on Aer<br>ly Vegetated Cond<br>Stained Leaves (E<br>ervations:<br>ater present?<br>present?                                     | ial Imagei<br>cave Surfa<br>9)<br>Yes              | <u>s require</u><br>y (B7)             | d: check  | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin Mi<br>Gauge<br>Other (           | apply)<br>Fauna (I<br>uatic Pla<br>an Sulfidd<br>d Rhizos<br>ce of Rec<br>lron Red<br>uck Surfa<br>or Weil 1<br>Explain in<br>Depth<br>Depth          | B13)<br>ants (B14)<br>e Odor (C1)<br>pheres on L<br>duced Iron (<br>duced Iron (<br>luction in Til<br>ace (C7)<br>Data (D9)<br>n Remarks)<br>(inches): | Vere not sa                   | mpled. Sol                                                                                                                            | ils are assumed to be<br>icators (minimum of two requin<br>Soil Cracks (B6)<br>Patterns (B10)<br>son Water Table (C2)<br>Burrows (C8)<br>In Visible on Aerial Imagery (C9)<br>or Stressed Plants (D1)<br>ohic Position (D2)<br>utral Test (D5)                    |
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US Army Corps of Engineers

**Midwest** Region

## WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                                                                                                          | City/C           | County: V                     | Vaukegan/L                  | ake Sampling Date: 5-2-12                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------|
| Applicant/Owner: NSG                                                                                                                     |                  | State:                        | Illinois                    | Sampling Point: 5                                                                                    |
| Investigator(s): Hey and Associates (Kuykendall/Mosca)                                                                                   |                  | Section                       | n, Township,                | Range: S 15, T 45N, R 12E                                                                            |
| Landform (hillslope, terrace, etc.):                                                                                                     |                  | Local rel                     | lief (concave               | , convex, none): none                                                                                |
| Slope (%): Lat: 42.372653                                                                                                                |                  | Long:                         |                             |                                                                                                      |
| Soil Map Unit Name 802B loamy                                                                                                            |                  |                               |                             | lassification:                                                                                       |
| Are climatic/hydrologic conditions of the site typical for thi                                                                           | is time of       | the year?                     |                             | no, explain in remarks)                                                                              |
| Are vegetation Y, soil Y, or hydrology                                                                                                   |                  | -                             |                             | · · · · · · · · · · · · · · · · · · ·                                                                |
| Are vegetation , soil , or hydrology                                                                                                     |                  |                               |                             | Are "normal circumstances"<br>present? N                                                             |
| SUMMARY OF FINDINGS                                                                                                                      |                  |                               |                             | (If needed, explain any answers in remarks.)                                                         |
| Hydrophytic vegetation present?                                                                                                          |                  |                               |                             |                                                                                                      |
| Hydric soil present? Y                                                                                                                   | - ` - }          | is the sa                     | mpled area                  | within a wetlan N                                                                                    |
| Wetland hydrology present? N                                                                                                             | .                | f yes, opti                   | ional wetland               | d site ID:                                                                                           |
| Remarks: (Explain allemative procedures here or in a se                                                                                  | parate re        | port.)                        |                             |                                                                                                      |
| The subject property is a former manufactured gas<br>remediation in the past. The property<br>VEGETATION Use scientific names of plants. | may cor          | at has under<br>Itain various | gone variou<br>depths of fi | is stages of investigation, construction, and<br>Il material & contaminated soil.                    |
|                                                                                                                                          |                  | Densinen                      | Indicator                   | Dominance Test Worksheet                                                                             |
|                                                                                                                                          | bsolute<br>Cover | Dominan<br>t Species          | Staus                       |                                                                                                      |
| 1 Robinia pseudoacacia                                                                                                                   | 50               | Y                             | FACU                        | Number of Dominant Species<br>that are OBL, FACW, or FAC: 4 (A)                                      |
| 2 Populus deltoides                                                                                                                      | 20               | Y                             | FAC                         | Total Number of Dominant                                                                             |
| 3                                                                                                                                        |                  |                               |                             | Species Across all Strata: 9 (B)                                                                     |
| 4                                                                                                                                        |                  |                               |                             | Percent of Dominant Species                                                                          |
| 5                                                                                                                                        | 70               | = Total Cover                 | ·                           | that are OBL, FACW, or FAC: 44.44% (A/B)                                                             |
| Sapling/Shrub stratun (Plot size: )                                                                                                      |                  |                               |                             | Prevalence Index Worksheet                                                                           |
| 1 Cornus stolonifera                                                                                                                     | 20               | Y                             | FACW                        | Total % Cover of:                                                                                    |
| 2 Rhamnus cathartica                                                                                                                     | 10               |                               | FACU                        | OBL species $0 \times 1 = 0$                                                                         |
| 3 Lonicera tatarica                                                                                                                      | 10               |                               | FACU                        | FACW species 20 x 2 = 40                                                                             |
| 4 Rhamnus frangula                                                                                                                       | 10               | Y                             | FAC                         | FAC species $50 \times 3 = 150$                                                                      |
| 5                                                                                                                                        |                  |                               |                             | FACU species 90 x 4 = 360                                                                            |
| _                                                                                                                                        | 50               | = Total Cover                 |                             | UPL species 10 x 5 = 50                                                                              |
| Herb stratum (Plot size:)                                                                                                                |                  |                               |                             | Column totals 170 (A) 600 (B)                                                                        |
| 1 Solidago altissima                                                                                                                     | 20               | <u> </u>                      | FACU                        | Prevalence Index = B/A = 3.53                                                                        |
| 2 Alliaria petiolata                                                                                                                     | 20               | Y                             | FAC                         | · · · · · · · · · · · · · · · · · · ·                                                                |
| 3 Hesperis matronalis                                                                                                                    | 10               | <u> </u>                      | UPL                         | Hydrophytic Vegetation Indicators:                                                                   |
| 4                                                                                                                                        |                  |                               |                             | Rapid test for hydrophytic vegetation                                                                |
| 5                                                                                                                                        |                  | <u> </u>                      |                             | Dominance test is >50%                                                                               |
| 6                                                                                                                                        |                  | •                             | ·                           | Prevalence index is ≤3.0*                                                                            |
| 8                                                                                                                                        |                  |                               |                             | Morphogical adaptations* (provide                                                                    |
| 9                                                                                                                                        |                  | <u> </u>                      |                             | supporting data in Remarks or on a<br>separate sheet)                                                |
| 10                                                                                                                                       |                  |                               |                             | ) — · · · ·                                                                                          |
|                                                                                                                                          | 50               | = Total Cover                 |                             | Problematic hydrophytic vegetation*<br>(explain)                                                     |
| Woody vine stratum (Plot size:)                                                                                                          |                  |                               |                             | *Indicators of hydric soll and wetland hydrology must be<br>present, unless disturbed or problematic |
| 2                                                                                                                                        |                  |                               |                             | Hydrophytic                                                                                          |
|                                                                                                                                          | 0                | = Total Cover                 |                             | vegetation                                                                                           |
|                                                                                                                                          | ~ ·              |                               |                             | present? <u>N</u>                                                                                    |
| Remarks: (Include photo numbers here or on a separate                                                                                    | sheet)           |                               |                             |                                                                                                      |

|                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                    |                                    | depth ne                   |          |                                                                                                                                   |                                                                                                                                                      | e indicator                                                                                                                                                          | r or confirm       | the abs                                                                        | ence of in                                                                                                                                                                          | dicators.)                                                                                                                                                               |         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Depth                                                                                                                                                                                                                                                                                        | Matrix                                                                                                                                                                                                                                                                                                             | %                                  | Calar (m                   |          | <u>iox Feat</u>                                                                                                                   |                                                                                                                                                      | 1.0.0**                                                                                                                                                              | Tau                | ture                                                                           |                                                                                                                                                                                     | Dementes                                                                                                                                                                 | Remarks |
| (Inches)                                                                                                                                                                                                                                                                                     | Color (moist)                                                                                                                                                                                                                                                                                                      | -70                                | Color (mo                  |          | %                                                                                                                                 | Type*                                                                                                                                                | Loc**                                                                                                                                                                | 1ex                |                                                                                |                                                                                                                                                                                     | Remarks                                                                                                                                                                  |         |
|                                                                                                                                                                                                                                                                                              | See                                                                                                                                                                                                                                                                                                                |                                    |                            |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | Remarks                                                                                                                                                                                                                                                                                                            |                                    |                            | ·.       |                                                                                                                                   | <u> </u>                                                                                                                                             | ┽───┼                                                                                                                                                                | <u> </u>           |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | Below                                                                                                                                                                                                                                                                                                              |                                    |                            |          |                                                                                                                                   | ·                                                                                                                                                    | -ll-                                                                                                                                                                 |                    |                                                                                |                                                                                                                                                                                     | <u> </u>                                                                                                                                                                 |         |
|                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                    |                                    |                            |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                    |                                    |                            |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                    |                                    |                            |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                    |                                    |                            |          | <br>                                                                                                                              | 1                                                                                                                                                    |                                                                                                                                                                      |                    |                                                                                | -                                                                                                                                                                                   |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | ┟╼╌╌╌╧╼┼                                                                                                                                                                                                                                                                                                           |                                    |                            | <b>_</b> |                                                                                                                                   |                                                                                                                                                      | $\uparrow - \uparrow$                                                                                                                                                | · ····             |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
| vne: C = (                                                                                                                                                                                                                                                                                   | Concentration, D =                                                                                                                                                                                                                                                                                                 | Depletir                           | n RM ≂ R                   | educe    | ed Matri                                                                                                                          | 1<br>x. MS =                                                                                                                                         | Masked Sa                                                                                                                                                            | nd Grains.         | **Loc                                                                          | ation: PL =                                                                                                                                                                         | Pore Lining, M =                                                                                                                                                         | Mairi   |
|                                                                                                                                                                                                                                                                                              | oil Indicators:                                                                                                                                                                                                                                                                                                    | Dopio II                           | , i un i i                 |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     | Hydric Soils:                                                                                                                                                            |         |
| -                                                                                                                                                                                                                                                                                            | tisol (A1)                                                                                                                                                                                                                                                                                                         |                                    |                            | San      | dv Glev                                                                                                                           | ed Matr                                                                                                                                              | ix (S4)                                                                                                                                                              |                    |                                                                                |                                                                                                                                                                                     | 16) (LRR K, L, R)                                                                                                                                                        |         |
|                                                                                                                                                                                                                                                                                              | tic Epipedon (A2)                                                                                                                                                                                                                                                                                                  |                                    |                            | _        | idy Red                                                                                                                           |                                                                                                                                                      | IX (04)                                                                                                                                                              |                    |                                                                                | e (S7) (LRF                                                                                                                                                                         |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | ck Histic (A3)                                                                                                                                                                                                                                                                                                     |                                    |                            |          |                                                                                                                                   | atrix (S6                                                                                                                                            | <b>、</b>                                                                                                                                                             | ·                  |                                                                                | · · ·                                                                                                                                                                               | at (S3) (LRR K, L                                                                                                                                                        | E)      |
|                                                                                                                                                                                                                                                                                              | frogen Sulfide (A4)                                                                                                                                                                                                                                                                                                |                                    |                            |          |                                                                                                                                   | ky Mine                                                                                                                                              | -                                                                                                                                                                    |                    |                                                                                |                                                                                                                                                                                     | ar (00) (EIGN R, E<br>es (F12) (LRR K, I                                                                                                                                 |         |
|                                                                                                                                                                                                                                                                                              | atified Layers (A5)                                                                                                                                                                                                                                                                                                |                                    |                            | _        |                                                                                                                                   | yed Mat                                                                                                                                              |                                                                                                                                                                      |                    | -                                                                              |                                                                                                                                                                                     | ace (TF12)                                                                                                                                                               | L, N)   |
|                                                                                                                                                                                                                                                                                              | m Muck (A10)                                                                                                                                                                                                                                                                                                       |                                    |                            | _        |                                                                                                                                   | latrix (F3                                                                                                                                           |                                                                                                                                                                      |                    |                                                                                | in in remar                                                                                                                                                                         |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | pleted Below Dark                                                                                                                                                                                                                                                                                                  | Quefaco                            | (0.11)                     |          |                                                                                                                                   | k Surfac                                                                                                                                             | -                                                                                                                                                                    |                    | ei (expiai                                                                     |                                                                                                                                                                                     | KS)                                                                                                                                                                      |         |
| _                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                    |                                    | (ATT)                      | _        |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     | •                                                                                                                                                                        |         |
|                                                                                                                                                                                                                                                                                              | ck Dark Surface (A                                                                                                                                                                                                                                                                                                 | •                                  | <u> </u>                   |          |                                                                                                                                   |                                                                                                                                                      | ace (F7)                                                                                                                                                             |                    |                                                                                |                                                                                                                                                                                     | c vegetation and v                                                                                                                                                       |         |
|                                                                                                                                                                                                                                                                                              | ndy Mucky Mineral                                                                                                                                                                                                                                                                                                  |                                    |                            | Rec      | юх цер                                                                                                                            | ressions                                                                                                                                             | 5 (178)                                                                                                                                                              | hydi               | ology mu                                                                       |                                                                                                                                                                                     | ent, unless disturb                                                                                                                                                      | ped or  |
|                                                                                                                                                                                                                                                                                              | m Mucky Peat or P                                                                                                                                                                                                                                                                                                  |                                    |                            |          |                                                                                                                                   |                                                                                                                                                      | _                                                                                                                                                                    |                    | -                                                                              | proble                                                                                                                                                                              |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | I DUAR /IE ABOAM/AR                                                                                                                                                                                                                                                                                                |                                    |                            |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     |                                                                                                                                                                          |         |
|                                                                                                                                                                                                                                                                                              | Layer (if observed                                                                                                                                                                                                                                                                                                 | d):                                |                            |          |                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     | v                                                                                                                                                                        |         |
| уре:                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                    | d):<br>                            |                            |          |                                                                                                                                   | <del>-</del> .                                                                                                                                       |                                                                                                                                                                      | Hydrid             | : soil pre                                                                     | esent?                                                                                                                                                                              | Y                                                                                                                                                                        |         |
| ype:<br>Depth (inch<br>Remarks:                                                                                                                                                                                                                                                              | es):                                                                                                                                                                                                                                                                                                               |                                    |                            |          |                                                                                                                                   | _                                                                                                                                                    |                                                                                                                                                                      |                    |                                                                                |                                                                                                                                                                                     | ·                                                                                                                                                                        |         |
| ype:<br>Depth (inch<br>Remarks:<br>The sub<br>hydric.                                                                                                                                                                                                                                        | es):                                                                                                                                                                                                                                                                                                               |                                    | of potentia                | ally c   | ontami                                                                                                                            | nated s                                                                                                                                              | soils and v                                                                                                                                                          |                    |                                                                                |                                                                                                                                                                                     | ·                                                                                                                                                                        | e       |
| ype:<br>Depth (inch<br>Remarks:<br>The sub<br>hydric.                                                                                                                                                                                                                                        | es):<br>ject property cor<br>DGY                                                                                                                                                                                                                                                                                   | nsists o                           | f potentia                 | ally c   | ontami                                                                                                                            | nated s                                                                                                                                              | soils and v                                                                                                                                                          |                    |                                                                                |                                                                                                                                                                                     | ·                                                                                                                                                                        | e       |
| ype:<br>bepth (inch<br>cemarks:<br>The sub<br>hydric.<br><b>IYDROL</b><br>Vetland Hy                                                                                                                                                                                                         | es):<br>ject property cor<br>DGY<br>drology Indicator                                                                                                                                                                                                                                                              | nsists o                           |                            |          |                                                                                                                                   |                                                                                                                                                      | soils and v                                                                                                                                                          | vere not s         | ampled.                                                                        | . Soils are                                                                                                                                                                         | e assumed to b                                                                                                                                                           |         |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL(<br>Vetland Hy<br>rimary Ind                                                                                                                                                                                                   | es):<br>ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o                                                                                                                                                                                                                                       | nsists o                           |                            |          | all that a                                                                                                                        | apply)                                                                                                                                               |                                                                                                                                                                      | vere not s         | ampled.                                                                        | . Soils are                                                                                                                                                                         | e assumed to b                                                                                                                                                           |         |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>/etland Hy<br>nmary Ind<br>Surface                                                                                                                                                                                          | es):<br>ject property cor<br>DGY<br>Idrology Indicator<br>icators (minimum o<br>Water (A1)                                                                                                                                                                                                                         | nsists o                           |                            |          | all that a                                                                                                                        | apply)<br>: Fauna (                                                                                                                                  | B13)                                                                                                                                                                 | vere not s         | ampled.                                                                        | . Soils are                                                                                                                                                                         | e assumed to b<br>s (minimum of two<br>acks (B6)                                                                                                                         |         |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wi                                                                                                                                                                              | es):<br>ject property cor<br>DGY<br>rdrology Indicator:<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)                                                                                                                                                                                                     | nsists o                           |                            |          | all that a<br>Aquatic<br>True Ac                                                                                                  | apply)<br>: Fauna (<br>quatic Pla                                                                                                                    | (B13)<br>ants (B14)                                                                                                                                                  | were not s         | ampled.                                                                        | . Soils are<br>y Indicators<br>face Soil Cri<br>inage Patter                                                                                                                        | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ms (B10)                                                                                                             |         |
| ype:<br>emarks:<br>The sub<br>hydric.<br><b>YDROL</b><br>(etland Hy<br>rimary Ind<br>Surface<br>High Wa<br>Saturati                                                                                                                                                                          | es):<br>ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)                                                                                                                                                                                           | nsists o                           |                            |          | all that a<br>Aquatic<br>True Ac                                                                                                  | apply)<br>: Fauna (<br>quatic Pla                                                                                                                    | B13)                                                                                                                                                                 | were not s         | ampled.                                                                        | . Soils are<br>v Indicators<br>face Soil Cri<br>inage Patter<br>Season Wa                                                                                                           | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ms (B10)<br>ater Table (C2)                                                                                          |         |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N                                                                                                                                                       | es):<br>ject property cor<br>OGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)                                                                                                                                                                             | nsists o                           |                            |          | all that a<br>Aquatic<br>True A<br>Hydrog<br>Oxidize                                                                              | apply)<br>: Fauna (<br>quatic Pla<br>en Sulfid                                                                                                       | (B13)<br>ants (B14)                                                                                                                                                  | vere not s         | ampled.                                                                        | . Soils are<br>v Indicators<br>face Soil Cri-<br>inage Patter<br>Season Wa<br>vfish Burrow                                                                                          | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br><i>v</i> s (C8)                                                                       | ) requ  |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL(<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N<br>Sedime                                                                                                                                            | es):<br>ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)                                                                                                                                                         | nsists o                           |                            |          | all that a<br>Aquatic<br>True Ad<br>Hydrog<br>Oxidize<br>(C3)                                                                     | <u>apply)</u><br>Fauna (<br>quatic Pla<br>en Sulfid<br>ed Rhizos                                                                                     | B13)<br>ants (B14)<br>le Odor (C1)<br>spheres on L                                                                                                                   | vere not s         | ampled                                                                         | y Indicators<br>v Indicators<br>face Soil Cri<br>inage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib                                                                         | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>Ne on Aerial Image                                                         | ) requ  |
| ype:<br>epth (inch<br>iemarks:<br>The sub<br>hydric.<br>iYDROL(<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wa<br>Saturati<br>Water N<br>Sedime<br>Drift De                                                                                                                               | es):<br>ject property cor<br>DGY<br>rdrology Indicator:<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)                                                                                                                                         | nsists o                           |                            |          | all that a<br>Aquatic<br>True Ad<br>Hydrog<br>Oxidize<br>(C3)                                                                     | <u>apply)</u><br>Fauna (<br>quatic Pla<br>en Sulfid<br>ed Rhizos                                                                                     | B13)<br>ants (B14)<br>ie Odor (C1)                                                                                                                                   | vere not s         | ampled<br>Gecondar<br>Drai<br>Drai<br>Cray<br>Satu                             | . Soils are<br><u>v Indicators</u><br>ace Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib                                                                     | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ms (B10)<br>ater Table (C2)<br>vs (C8)<br>ale on Aerial Image<br>ssed Plants (D1)                                    | ) requ  |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wa<br>Saturati<br>Water N<br>Saturati<br>Drift De<br>Algal M                                                                                                                    | es):<br>ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)                                                                                                                      | nsists o                           |                            |          | ali that a<br>Aquatic<br>True Ad<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>Recent                                                 | apply)<br>: Fauna (<br>quatic Pla<br>en Sulfid<br>ed Rhizos<br>ace of Re                                                                             | B13)<br>ants (B14)<br>le Odor (C1)<br>spheres on L                                                                                                                   | iving Roots        | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | . Soils are<br><u>y Indicators</u><br>ace Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>nted or Stree<br>morphic Po                                      | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>vle on Aerial Image<br>ssed Plants (D1)<br>vsition (D2)                    | ) requ  |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wa<br>Saturati<br>Water N<br>Saturati<br>Drift De<br>Algal M<br>Iron De                                                                                                         | ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (E5)                                                                                                               | nsists o                           | required; c                |          | all that a<br>Aquatic<br>True Ac<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)                                         | apply)<br>Fauna (<br>quatic Pla<br>en Sulfid<br>ed Rhizos<br>ice of Re<br>i Iron Red                                                                 | B13)<br>ants (B14)<br>ie Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til                                                                                 | iving Roots        | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | . Soils are<br><u>v Indicators</u><br>ace Soil Cra<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib                                                                     | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>vle on Aerial Image<br>ssed Plants (D1)<br>vsition (D2)                    | ) requ  |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>Vetland Hy<br>rimary Ind<br>Saturati<br>Bigh Wi<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Algal Mi<br>Iron Dej<br>Jinundat                                                                                            | es):<br>ject property cor<br>OGY<br>drology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial                                                                                | s:<br><u>f one is</u>              | <u>required; c</u><br>(B7) |          | ali that a<br>Aquatic<br>True Ar<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin M                               | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>ice of Re<br>i Iron Red<br>uck Surfi                                                     | B13)<br>ants (B14)<br>le Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)                                                                     | iving Roots        | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | . Soils are<br><u>y Indicators</u><br>ace Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>nted or Stree<br>morphic Po                                      | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>vle on Aerial Image<br>ssed Plants (D1)<br>vsition (D2)                    | ) requ  |
| ype:<br>epth (inch<br>emarks:<br>The sub<br>hydric.<br>IYDROL(<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Algal Mi<br>Iron De<br>Inundat                                                                                              | es):<br>ject property cor<br>OGY<br>drology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav                                                          | Imagery                            | <u>required; c</u><br>(B7) |          | ali that a<br>Aquatic<br>True A<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>(C6)<br>Thin M<br>Gauge                                 | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>de of Re<br>ice of Re<br>ice of Re<br>uck Suff<br>or Well                                | B13)<br>ants (B14)<br>ie Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)<br>Data (D9)                                                        | iving Roots<br>C4) | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | . Soils are<br><u>y Indicators</u><br>ace Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>nted or Stree<br>morphic Po                                      | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>vle on Aerial Image<br>ssed Plants (D1)<br>vsition (D2)                    | ) requ  |
| ype:<br>Pepth (inch<br>lemarks:<br>The sub<br>hydric.<br>IYDROL(<br>Vetland Hy<br>rimary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Algal Mi<br>Iron De<br>Nagarsel<br>Water-S                                                                                | es):<br>ject property cor<br>DGY<br>drology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav<br>Stained Leaves (B9)                                   | Imagery                            | <u>required; c</u><br>(B7) |          | ali that a<br>Aquatic<br>True A<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>(C6)<br>Thin M<br>Gauge                                 | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>de of Re<br>ice of Re<br>ice of Re<br>uck Suff<br>or Well                                | B13)<br>ants (B14)<br>le Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)                                                                     | iving Roots<br>C4) | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | . Soils are<br><u>y Indicators</u><br>ace Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>nted or Stree<br>morphic Po                                      | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>vle on Aerial Image<br>ssed Plants (D1)<br>vsition (D2)                    | ) requ  |
| ype:<br>Depth (inch<br>Remarks:<br>The sub<br>hydric.<br>HyDROL(<br>Vetland Hy<br>Primary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Algal Mi<br>Iron Dej<br>Nift De<br>Sparsel<br>Water-S                                                                    | es):<br>ject property cor<br>DGY<br>drology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav<br>Stained Leaves (B9)<br>rvations:                      | Imagery                            | <u>required; c</u><br>(B7) | <u></u>  | ali that a<br>Aquatic<br>True A<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>(C6)<br>Thin M<br>Gauge<br>Other (                      | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>de of Re<br>t Iron Rec<br>uck Surf<br>or Well<br>(Explain 1                              | B13)<br>ants (B14)<br>ie Odor (C1)<br>spheres on L<br>duced iron (<br>duction in Til<br>ace (C7)<br>Data (D9)<br>in Remarks)                                         | iving Roots<br>C4) | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | y Indicators<br>face Soil Cri<br>inage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>inted or Stree<br>proorphic Poo<br>C-Neutral Te                                      | e assumed to b<br>s (minimum of two<br>acks (B6)<br>ns (B10)<br>ater Table (C2)<br>vs (C8)<br>vle on Aerial Image<br>ssed Plants (D1)<br>vsition (D2)                    | ) requ  |
| ype:<br>Depth (inch<br>Remarks:<br>The sub<br>hydric.<br>HYDROL(<br>Vetland Hy<br>Primary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Algal Mi<br>Iron De<br>Sparsel<br>Water-S                                                                                | es):<br>ject property cor<br>DGY<br>drology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav<br>Stained Leaves (B9)<br>rvations:<br>ter present?      | Imagery                            | <u>required; c</u><br>(B7) |          | ali that a<br>Aquatic<br>True A<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>(C6)<br>Thin M<br>Gauge                                 | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>ce of Re<br>i Iron Red<br>uck Suff<br>or Well<br>(Explain i                              | B13)<br>ants (B14)<br>ie Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)<br>Data (D9)                                                        | iving Roots<br>C4) | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | . Soils are<br><u>y Indicators</u><br>ace Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>nted or Stree<br>morphic Po                                      | e assumed to b<br><u>s (minimum of two</u><br>acks (B6)<br>ms (B10)<br>ater Table (C2)<br>vs (C8)<br>ale on Aerial Image<br>issed Plants (D1)<br>sition (D2)<br>ast (D5) | ) requ  |
| ype:<br>Depth (inch<br>Remarks:<br>The sub<br>hydric.<br>HyDROL (<br>Vetland Hy<br>Primary Ind<br>Surface<br>High Water N<br>Sedime<br>Drift De<br>Algal M<br>Iron Dej<br>Inundat<br>Sparsel<br>Water-S<br>Field Obse<br>Surface wa<br>Nater table                                           | ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav<br>Stained Leaves (B9)<br>rvations:<br>ter present?<br>present? | Imagery<br>Yes                     | <u>required; c</u><br>(B7) | theck    | all that a<br>Aquatic<br>True Ar<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin M<br>Gauge<br>Other (           | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>ce of Re<br>lron Red<br>uck Suff<br>or Well<br>Explain i<br>Depth                        | B13)<br>ants (B14)<br>ie Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)<br>Data (D9)<br>in Remarks)<br>a (inches):                          | iving Roots<br>C4) | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Second   | v Indicators<br>v Indicators<br>face Soil Crr<br>nage Patter<br>Season Wa<br>vfish Burrow<br>uration Visib<br>nted or Stree<br>omorphic Po<br>C-Neutral Te<br>Wetland               | e assumed to b<br><u>s (minimum of two</u><br>acks (B6)<br>ms (B10)<br>ater Table (C2)<br>vs (C8)<br>ble on Aerial Imagel<br>sed Plants (D1)<br>sition (D2)<br>est (D5)  | ) requ  |
| ype:<br>Depth (inch<br>Remarks:<br>The sub<br>hydric.<br>HyDROL (<br>Vetland Hy<br>Primary Ind<br>Surface<br>High Water N<br>Sedime<br>Drift De<br>Algal M<br>Iron Dej<br>Inundat<br>Sparsel<br>Water-S<br>Field Obse<br>Surface wa<br>Nater table                                           | es):<br>ject property cor<br>OGY<br>drology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>darks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav<br>Stained Leaves (B9)<br>rvations:<br>ter present?      | Imagery<br>Yes<br>Yes              | <u>required; c</u><br>(B7) | theck    | all that a<br>Aquatic<br>True Ad<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin M<br>Gauge<br>Other (<br>X      | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>ce of Re<br>lron Red<br>uck Suff<br>or Well<br>Explain i<br>Depth                        | B13)<br>ants (B14)<br>le Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)<br>Data (D9)<br>in Remarks)<br>h (inches):<br>h (inches):           | iving Roots<br>C4) | ampled<br>Secondar<br>Surf<br>Drai<br>Drai<br>Cray<br>Satu<br>Stur<br>Secondar | v Indicators<br>v Indicators<br>face Soil Cri<br>nage Patter<br>Season Wa<br>vfish Burrow<br>uration Visib<br>hited or Stree<br>omorphic Po<br>C-Neutral Te<br>Wetland<br>hydrology | e assumed to b<br><u>s (minimum of two</u><br>acks (B6)<br>ms (B10)<br>ater Table (C2)<br>vs (C8)<br>ble on Aerial Image<br>issed Plants (D1)<br>sition (D2)<br>ast (D5) | ) requ  |
| ype:<br>epth (inch<br>lemarks:<br>The sub<br>hydric.<br><b>YDROL</b><br><b>Vetland Hy</b><br>rimary Ind<br>Surface<br>High Wi<br>Saturati<br>Water N<br>Sedime<br>Drift De<br>Algal M<br>Iron De<br>Sparsel<br>Water-S<br>Seld Obse<br>Surface wa<br>Vater table<br>Saturation<br>Includes c | ject property cor<br>DGY<br>rdrology Indicator<br>icators (minimum o<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>Marks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aerial<br>y Vegetated Concav<br>Stained Leaves (B9)<br>rvations:<br>ter present?<br>present? | Imagery<br>e Surface<br>Yes<br>Yes | (B7)<br>e (B8)             | check    | all that a<br>Aquatic<br>True Ar<br>Hydrog<br>Oxidize<br>(C3)<br>Presen<br>Recent<br>(C6)<br>Thin M<br>Gauge<br>Other (<br>X<br>X | apply)<br>Fauna (<br>quatic Pl<br>en Sulfid<br>ed Rhizos<br>de Rhizos<br>ce of Re<br>lron Red<br>uck Suff<br>or Well<br>(Explain i<br>Depth<br>Depth | B13)<br>ants (B14)<br>le Odor (C1)<br>spheres on L<br>duced Iron (<br>duction in Til<br>ace (C7)<br>Data (D9)<br>in Remarks)<br>n Remarks)<br>(inches):<br>(inches): | vere not s         | ampled.                                                                        | v Indicators<br>face Soil Cri<br>nage Patter<br>Season Wa<br>yfish Burrow<br>uration Visib<br>hited or Stree<br>prorphic Po<br>C-Neutral Te<br>Wetland<br>hydrology<br>present?     | e assumed to b<br><u>s (minimum of two</u><br>acks (B6)<br>ms (B10)<br>ater Table (C2)<br>vs (C8)<br>ble on Aerial Image<br>issed Plants (D1)<br>sition (D2)<br>ast (D5) | ) requ  |

**Midwest Region** 

### WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                                 | City/C       | County: <u> </u> | Naukegan/L    | ake Sampling                           | Date:                                     | 5-2-12            |
|-----------------------------------------------------------------|--------------|------------------|---------------|----------------------------------------|-------------------------------------------|-------------------|
| Applicant/Owner: NSG                                            |              | State:           | Minois        | Sampling I                             | Point:                                    | 6                 |
| Investigator(s): Hey and Associates (Kuykendail/Mosca)          |              | Sectio           | n, Township   | , Range:                               | S 15, T 45N, R                            | 12E               |
| Landform (hillslope, terrace, etc.):                            |              | Local re         | lief (concave | , convex, none):                       | Conc                                      | ave               |
| Slope (%): Lat: 42.37278                                        |              | Long:            | ~87.82357     | 3 Datum:                               |                                           |                   |
| Soil Map Unit Name 802B loamy                                   |              | . —              | VWI C         | lassification:                         |                                           |                   |
| Are climatic/hydrologic conditions of the site typical for this | s time o     | f the year?      | Y (if         | no, explain in rema                    |                                           | · · · · · · · · · |
| Are vegetation Y , soil Y , or hydrology                        | Y            | significantly    | disturbed?    | Are "norm                              | nal circumstanc                           | '                 |
| Are vegetation , soil , or hydrology                            |              | naturally pro    | blematic?     |                                        | prese                                     |                   |
| SUMMARY OF FINDINGS                                             |              |                  |               | (If needed, explain                    | 1 any answers                             | in remarks.)      |
| Hydrophytic vegetation present? Y                               |              |                  |               | · · ·                                  |                                           |                   |
| Hydric soil present? Y                                          |              | is the sa        | ampled area   | within a wetlan                        | Y                                         |                   |
| Wetland hydrology present? Y                                    | 1            | f yes, opt       | ional wetian  | d site ID:                             |                                           |                   |
| Remarks: (Explain alternative procedures here or in a sep       | parate re    | eport.)          |               |                                        |                                           |                   |
| The subject property is a former manufactured gas               |              |                  |               |                                        |                                           | uction, and       |
| remediation in the past. The property                           | may co       | ntain various    | depths of fi  | Il material & conta                    | minated soil.                             | <u>_</u>          |
| VEGETATION Use scientific names of plants.                      |              |                  |               | ·                                      |                                           |                   |
|                                                                 | osolute      |                  | Indicator     | Dominance Test                         | Worksheet                                 |                   |
| · · · · · · · · · · · · · · · · · · ·                           |              | t Species        | Staus         | Number of Domina                       |                                           |                   |
| 1 Fraxinus pennsylvanica                                        | 10           | <u> </u>         | FACW          | that are OBL, FAC                      | N, or FAC:                                | 5(A)              |
| 2                                                               |              | ·                |               | Total Number o<br>Species Acros        |                                           | 5 (B)             |
| 4                                                               |              | <u> </u>         | ·             |                                        |                                           | 5(B)              |
|                                                      |              |                  |               | Percent of Domina<br>that are OBL, FAC |                                           | 0.00% (A/B)       |
|                                                                 | 10           | = Total Cover    | · · ·         |                                        |                                           |                   |
| Sapling/Shrub stratun (Plot size: )                             |              |                  |               | Prevalence Inde                        | x Worksheet                               |                   |
| 1 Salix discolor                                                | 30           | Y                | FACW          | Total % Cover of:                      | :                                         |                   |
| 2 Comus stolonifera                                             | 20           | Y                | FACW          | OBL species                            | 20 x 1 =                                  | 20                |
| 3                                                               |              |                  | · · · · · ·   | FACW species                           | 110 x 2 =                                 | 220               |
| 4                                                               |              | ·                | <u> </u>      | FAC species                            | 0 x3=                                     | 0                 |
| 5                                                               |              |                  |               | FACU species                           |                                           | 0                 |
|                                                                 | 50           | ⇒Total Cove      | r ·           | UPL species                            | <u>0</u> x5≍                              | 0                 |
| Herb stratum (Plot size:)                                       | <b>6</b> 0 · | Y                | FACIN         | Column totals                          | 130 (A)                                   | 240 (B)           |
| 1 Potentilla anserina                                           | 50<br>20     | ·                | FACWOBL       | Prevalence Index                       | (= B/A =                                  | 1.85              |
|                                                                 |              |                  |               | Hydrophytic Veg                        | retation Indic:                           | ators:            |
|                                                                 |              |                  |               |                                        | r hydrophytic va                          |                   |
| 5                                                               |              | · ·              |               | X Dominance t                          |                                           |                   |
| 6                                                               |              | · · · · · ·      |               | X Prevalence i                         |                                           |                   |
| 7                                                               |              |                  |               | Mombonical                             | adaptations* (p                           | nrovida           |
| В                                                               |              | •                |               |                                        | ata in Remarks                            |                   |
| 9                                                               |              |                  |               | separate she                           | et)                                       | · ·               |
| 10                                                              |              | - Tatal Cours    |               |                                        | hydrophytic veg                           | getation*         |
| Woody vine stratum (Plot size: )                                | 70           | = Total Cove     | 1             | (explain)                              |                                           |                   |
| 1                                                               |              |                  |               | *Indicators of hydrl<br>present, un    | c soil and wetland<br>less disturbed or p |                   |
| 2                                                               |              |                  |               | Hydrophytic                            | - <u> </u>                                |                   |
|                                                                 | 0            | = Total Cove     |               | vegetation                             | v                                         |                   |
|                                                                 |              |                  |               | present?                               | Y                                         |                   |
| Remarks: (Include photo numbers here or on a separate           | e sneet)     |                  |               |                                        |                                           |                   |

| rofile Desc<br>Depth<br>(Inches)                                                                                                                                                                                                                            | ription: (Descr<br>Matrix                                                                                                                                                                                                                                                                                                 | rihe to the                                                                      |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     | · · ·                                  |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                             | Motrix                                                                                                                                                                                                                                                                                                                    |                                                                                  | depth nee      |                                                                  |                                                                                                                                                                                                                          | e indicato                                                                                                                                                          | r or confirm t                         | ihe absence o                                                                                                                                                        | f indicators.)                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           | %                                                                                | Color (mo      | Redox F<br>ist) %                                                |                                                                                                                                                                                                                          | Loc**                                                                                                                                                               | Textu                                  |                                                                                                                                                                      | Remarks                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                             | Color (moist)                                                                                                                                                                                                                                                                                                             | 70                                                                               |                |                                                                  | <u> </u>                                                                                                                                                                                                                 |                                                                                                                                                                     | Jexu                                   | 18                                                                                                                                                                   |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             | See                                                                                                                                                                                                                                                                                                                       | ┨┨                                                                               |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             | Remarks                                                                                                                                                                                                                                                                                                                   | <u>↓</u>                                                                         |                |                                                                  |                                                                                                                                                                                                                          | <u>}}</u>                                                                                                                                                           |                                        |                                                                                                                                                                      | <b></b>                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                             | Below                                                                                                                                                                                                                                                                                                                     | <u>↓                                    </u>                                     |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           |                                                                                  |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      | ·                                                                                                                                                                                                               |
|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           |                                                                                  |                |                                                                  | _                                                                                                                                                                                                                        |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           |                                                                                  |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                     | 1.                                                                               |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           | <u> </u>                                                                         |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
| vpe: C = C                                                                                                                                                                                                                                                  | oncentration, D                                                                                                                                                                                                                                                                                                           | = Depletic                                                                       | on, RM = R     | educed M                                                         | l<br>atrix, MS ≃ I                                                                                                                                                                                                       | Masked Sa                                                                                                                                                           | and Grains,                            | **Location: I                                                                                                                                                        | PL = Pore Lining, M = Matrix                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                             | il Indicators:                                                                                                                                                                                                                                                                                                            | ·                                                                                |                |                                                                  |                                                                                                                                                                                                                          | _                                                                                                                                                                   |                                        |                                                                                                                                                                      | atic Hydric Soils:                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                             | isol (A1)                                                                                                                                                                                                                                                                                                                 |                                                                                  |                | Sandy G                                                          | eyed Matri                                                                                                                                                                                                               | x (S4)                                                                                                                                                              |                                        |                                                                                                                                                                      | (A16) (LRR K, L, R)                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                             | ic Epipedon (A2)                                                                                                                                                                                                                                                                                                          | )                                                                                | <u> </u>       | - *                                                              | edox (S5)                                                                                                                                                                                                                | • •                                                                                                                                                                 | ·                                      | Surface (S7) (                                                                                                                                                       |                                                                                                                                                                                                                 |
| <del>`</del>                                                                                                                                                                                                                                                | k Histic (A3)                                                                                                                                                                                                                                                                                                             | , .                                                                              |                | - *                                                              | Matrix (S6)                                                                                                                                                                                                              | )                                                                                                                                                                   |                                        |                                                                                                                                                                      | Peat (S3) (LRR K, L, R)                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                             | rogen Sulfide (A                                                                                                                                                                                                                                                                                                          | 4)                                                                               |                |                                                                  | Aucky Miner                                                                                                                                                                                                              |                                                                                                                                                                     | and the second                         | •                                                                                                                                                                    | asses (F12) (LRR K, L, R)                                                                                                                                                                                       |
| ·                                                                                                                                                                                                                                                           | tified Layers (A5                                                                                                                                                                                                                                                                                                         | •                                                                                |                | - '                                                              | Sleyed Matr                                                                                                                                                                                                              | • •                                                                                                                                                                 |                                        |                                                                                                                                                                      | Surface (TF12)                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                             | n Muck (A10)                                                                                                                                                                                                                                                                                                              | ,                                                                                |                |                                                                  | d Matrix (F3                                                                                                                                                                                                             |                                                                                                                                                                     |                                        | r (explain in rei                                                                                                                                                    |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             | leted Below Dar                                                                                                                                                                                                                                                                                                           | k Surface                                                                        | (A11)          |                                                                  | ark Surface                                                                                                                                                                                                              |                                                                                                                                                                     |                                        |                                                                                                                                                                      | • .                                                                                                                                                                                                             |
| · · · · ·                                                                                                                                                                                                                                                   | k Dark Surface                                                                                                                                                                                                                                                                                                            |                                                                                  |                | -                                                                | d Dark Surfa                                                                                                                                                                                                             |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                             | dy Mucky Minera                                                                                                                                                                                                                                                                                                           | • •                                                                              |                | -                                                                | Depressions                                                                                                                                                                                                              |                                                                                                                                                                     |                                        |                                                                                                                                                                      | hytic vegetation and weltand<br>present, unless disturbed or                                                                                                                                                    |
|                                                                                                                                                                                                                                                             | n Mucky Peat or                                                                                                                                                                                                                                                                                                           | · · ·                                                                            |                | -                                                                | -                                                                                                                                                                                                                        | <u> </u>                                                                                                                                                            | nyulu                                  |                                                                                                                                                                      | oblematic                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                             | Layer (if observ                                                                                                                                                                                                                                                                                                          |                                                                                  |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        | · · · ·                                                                                                                                                              |                                                                                                                                                                                                                 |
| ype:                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                           |                                                                                  |                |                                                                  |                                                                                                                                                                                                                          | 1                                                                                                                                                                   | Hydric :                               | soil present?                                                                                                                                                        | Y                                                                                                                                                                                                               |
| epth (inche                                                                                                                                                                                                                                                 | s):                                                                                                                                                                                                                                                                                                                       |                                                                                  |                |                                                                  | ·                                                                                                                                                                                                                        |                                                                                                                                                                     |                                        | •                                                                                                                                                                    | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                           |
|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           |                                                                                  |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     |                                        |                                                                                                                                                                      |                                                                                                                                                                                                                 |
| hydric ba                                                                                                                                                                                                                                                   | used on geomo                                                                                                                                                                                                                                                                                                             |                                                                                  |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     | were not sa                            | mpled. Soils                                                                                                                                                         | s are assumed to be                                                                                                                                                                                             |
| YDROLC                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                           | orphic po                                                                        |                |                                                                  |                                                                                                                                                                                                                          |                                                                                                                                                                     | were not sa                            | mpled. Soils                                                                                                                                                         | s are assumed to be                                                                                                                                                                                             |
| YDROLC                                                                                                                                                                                                                                                      | DGY                                                                                                                                                                                                                                                                                                                       | orphic po<br>ors:                                                                | osition, hy    | drology                                                          | and veget                                                                                                                                                                                                                | ation.                                                                                                                                                              |                                        |                                                                                                                                                                      | s are assumed to be                                                                                                                                                                                             |
| YDROLC<br>fetland Hydrimary Indic                                                                                                                                                                                                                           | DGY<br>drology Indicate                                                                                                                                                                                                                                                                                                   | orphic po<br>ors:                                                                | osition, hy    | drology<br>heck all th                                           | and veget                                                                                                                                                                                                                | ation.                                                                                                                                                              |                                        | condary Indica                                                                                                                                                       | ·                                                                                                                                                                                                               |
| YDROLC<br>fetland Hyd<br>fimary Indic<br>Surface V                                                                                                                                                                                                          | DGY<br>drology Indicate<br>cators (minimum                                                                                                                                                                                                                                                                                | orphic po<br>ors:                                                                | osition, hy    | heck all th                                                      | and veget                                                                                                                                                                                                                | ation.                                                                                                                                                              |                                        | condary Indica                                                                                                                                                       | ators (minimum of two requi                                                                                                                                                                                     |
| YDROLC<br>fetland Hydr<br>fimary Indic<br>Surface V<br>High Wat                                                                                                                                                                                             | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)                                                                                                                                                                                                                                                | orphic po<br>ors:                                                                | osition, hy    | heck all th<br>Aqu<br>X True                                     | and veget<br>hat apply)<br>hatic Fauna (                                                                                                                                                                                 | ation.<br>B13)                                                                                                                                                      | <u>Se</u>                              | condary Indica<br>Surface Soi                                                                                                                                        | ators (minimum of two requi<br>Il Cracks (B6)                                                                                                                                                                   |
| YDROLC<br>(etland Hyd<br>rimary Indic<br>Surface V<br>High Wat<br>C Saturatio                                                                                                                                                                               | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)                                                                                                                                                                                                                                                | orphic po<br>ors:                                                                | osition, hy    | heck all th<br>Aqu<br>X True<br>Hyd                              | and veget<br><u>nat apply)</u><br>latic Fauna (l<br>e Aquatic Pla<br>lrogen Sulfid                                                                                                                                       | ation.<br>B13)<br>ants (B14)<br>e Odor (C1                                                                                                                          | <u>Se</u><br>                          | condary Indica<br>Surface Soi                                                                                                                                        | ators (minimum of two requin<br>Il Cracks (B6)<br>atterns (B10)<br>I Water Table (C2)                                                                                                                           |
| YDROLC<br>fetland Hyd<br>fimary Indic<br>Surface V<br>High Wat<br>Saturatio<br>Water Ma                                                                                                                                                                     | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)                                                                                                                                                                                                                                     | orphic po<br>ors:                                                                | osition, hy    | heck all th<br>Aqu<br>X True<br>Hyd                              | and veget<br><u>nat apply)</u><br>natic Fauna (l<br>e Aquatic Pla<br>frogen Sulfid<br>dízed Rhizos                                                                                                                       | ation.<br>B13)<br>ants (B14)<br>e Odor (C1                                                                                                                          |                                        | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Seasor<br>Crayfish Bu                                                                                            | ators (minimum of two requin<br>Il Cracks (B6)<br>atterns (B10)<br>I Water Table (C2)                                                                                                                           |
| YDROLC<br>/etland Hyd<br>rimary Indic<br>Surface V<br>High Wat<br>K Saturatio<br>Water Ma<br>Sadimen                                                                                                                                                        | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)                                                                                                                                                                                                                        | orphic po<br>ors:                                                                | osition, hy    | heck all th<br>Aque<br>X True<br>Oxic<br>(C3                     | and veget<br><u>nat apply)</u><br>natic Fauna (l<br>e Aquatic Pla<br>frogen Sulfid<br>dízed Rhizos                                                                                                                       | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on                                                                                                             | <u>Se</u><br><br><br>)<br>Living Roots | <u>condary Indica</u><br>Surface Soi<br>Drainage P<br>Dry-Seasor<br>Crayfish Bu<br>X Saturation V                                                                    | ators (minimum of two requin<br>Il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>nrows (C8)                                                                                                             |
| YDROLC<br>fetland Hyo<br>Surface V<br>High Wat<br>Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep                                                                                                                                                             | OGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>it Deposits (B2)                                                                                                                                                                                                    | orphic po<br>ors:                                                                | osition, hy    | heck all th<br>Aqu<br>X True<br>Hyd<br>Oxid<br>(C3<br>Pre        | and veget<br><u>at apply)</u><br>natic Fauna (I<br>e Aquatic Pla<br>frogen Sulfid<br>dized Rhizos<br>)<br>sence of Rec                                                                                                   | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron                                                                                               | <u>Se</u><br>                          | <u>condary Indica</u><br>Surface Soi<br>Drainage P<br>Dry-Seasor<br>Crayfish Bu<br>X Saturation V                                                                    | ators (minimum of two requin<br>Il Cracks (B6)<br>afterns (B10)<br>1 Water Table (C2)<br>1rrows (C8)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D <b>1</b> )                                         |
| YDROLC<br>(etland Hyd<br>Surface V<br>High Wat<br>Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mat                                                                                                                                                | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>it Deposits (B2)<br>posits (B3)                                                                                                                                                                        | orphic po<br>ors:                                                                | osition, hy    | heck all th<br>Aqu<br>X True<br>Hyd<br>Oxid<br>(C3<br>Pre        | and veget<br><u>at apply</u> )<br>atic Fauna (l<br>e Aquatic Pla<br>lrogen Sulfid<br>dized Rhizos<br>)<br>sence of Rec<br>vent (ron Red                                                                                  | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron                                                                                               | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage Pa<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted of S                                                          | ators (minimum of two requi<br>Il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>Irrows (C8)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)                                |
| YDROLC<br>(etland Hyo<br>surface V<br>High Wate<br>Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mal<br>Iron Dep                                                                                                                                   | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>to Deposits (B2)<br>oosits (B3)<br>tt or Crust (B4)                                                                                                                                                                 | orphic po                                                                        | required; c    | heck all th<br>Aqu<br>X True<br>(C3<br>Pre<br>Rec<br>(C6         | and veget<br><u>at apply</u> )<br>atic Fauna (l<br>e Aquatic Pla<br>lrogen Sulfid<br>dized Rhizos<br>)<br>sence of Rec<br>vent (ron Red                                                                                  | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>luction in T                                                                               | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage Pa<br>Dry-Seasor<br>Crayfish Bu<br>X Saturation V<br>Stunted of S<br>X Geomorphi                                           | ators (minimum of two requi<br>Il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>Irrows (C8)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)                                |
| YDROLC<br>fetland Hyc<br>fimary Indic<br>Surface V<br>High Wat<br>Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mat<br>Iron Dep<br>Inundatio                                                                                                       | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>der Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>at Deposits (B2)<br>posits (B3)<br>dt or Crust (B4)<br>posits (B5)                                                                                                                                     | orphic po<br>ors:<br><u>of one is</u><br>al Imagery                              | (B7)           | heck all th<br>Aqu<br>X True<br>(C3<br>Pre<br>Rec<br>(C6<br>Thir | and veget<br><u>at apply</u> )<br>atic Fauna (i<br>a Aquatic Pla<br>frogen Sulfid<br>dized Rhizos<br>)<br>sence of Rec<br>pent Iron Red<br>)                                                                             | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duced Iron<br>duction in T                                                                 | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage Pa<br>Dry-Seasor<br>Crayfish Bu<br>X Saturation V<br>Stunted of S<br>X Geomorphi                                           | ators (minimum of two requi<br>Il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>Irrows (C8)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)                                |
| IYDROLC<br>fetland Hyc<br>fimary Indic<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mat<br>Iron Dep<br>Inundatic<br>Sparsely                                                                                        | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>to Deposits (B2)<br>posits (B3)<br>tt or Crust (B4)<br>posits (B5)<br>on Visible on Aeri                                                                                                               | orphic po<br>ors:<br><u>n of one is</u><br>al Imagery<br>ave Surfac              | (B7)           | heck all th<br>Aqu<br>X True<br>(C3<br>Pre<br>Rec<br>Gau         | and veget<br><u>at apply</u> )<br>atic Fauna (l<br>a Aquatic Pla<br>rogen Sulfid<br>dized Rhizos<br>)<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa                                                              | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>luction in T<br>ace (C7)<br>Data (D9)                                                      | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage Pa<br>Dry-Seasor<br>Crayfish Bu<br>X Saturation V<br>Stunted of S<br>X Geomorphi                                           | ators (minimum of two requi<br>Il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>Irrows (C8)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)                                |
| IYDROLC<br>fetland Hyc<br>fimary Indic<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mai<br>Iron Dep<br>Inundatic<br>Sparsely<br>Water-Sl                                                                            | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>to Deposits (B2)<br>posits (B3)<br>tt or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>Vegetated Conce<br>tained Leaves (B5)                                                                     | orphic po<br>ors:<br><u>n of one is</u><br>al Imagery<br>ave Surfac              | (B7)           | heck all th<br>Aqu<br>X True<br>(C3<br>Pre<br>Rec<br>Gau         | and veget<br><u>at apply</u> )<br>atic Fauna (l<br>e Aquatic Pla<br>irogen Sulfid<br>dized Rhizos<br>)<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>uge or Well I                                            | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>luction in T<br>ace (C7)<br>Data (D9)                                                      | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage Pa<br>Dry-Seasor<br>Crayfish Bu<br>X Saturation V<br>Stunted of S<br>X Geomorphi                                           | ators (minimum of two requi<br>Il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>Irrows (C8)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)                                |
| IYDROLC<br>fetland Hyc<br>fimary Indic<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mai<br>Iron Dep<br>Inundatic<br>Sparsely<br>Water-Sl<br>ield Obser<br>furface wate                                              | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>arks (B3)<br>tor Crust (B4)<br>osits (B3)<br>tor Crust (B4)<br>osits (B5)<br>on Visible on Aeri-<br>Vegetated Conce<br>tained Leaves (B5)<br>vations:<br>er present?                                   | orphic po<br>ors:<br><u>n of one is</u><br>al Imagery<br>ave Surfac<br>9)<br>Yes | (B7)           | heck all the Aque Aque Aque Aque Aque Aque Aque Aqu              | and veget<br>at apply)<br>atic Fauna (le<br>a Aquatic Pla<br>lrogen Sulfid<br>dized Rhizos<br>)<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>uge or Well I<br>er (Explain in<br>X _ Depth                    | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duction in T<br>ace (C7)<br>Data (D9)<br>n Remarks<br>(inches):                            | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted or S<br>X Geomorphic<br>FAC-Neutra                            | ators (minimum of two requin<br>il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>rrrows (C3)<br>visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)<br>al Test (D5)<br>nd         |
| YDROLC<br>Vetland Hyo<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mai<br>Iron Dep<br>Inundatic<br>Sparsely<br>Water-Sl<br>ield Obser<br>Surface wate                                                               | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>to Deposits (B2)<br>posits (B3)<br>it or Crust (B4)<br>osits (B5)<br>on Visible on Aeria<br>Vegetated Conce<br>tained Leaves (B4)<br>vations:<br>er present?<br>present?                               | al Imagery<br>ave Surfac<br>9)<br>Yes<br>Yes                                     | (B7)           | heck all the Aque Aque Aque Aque Aque Aque Aque Aqu              | and veget<br><u>at apply</u> )<br>atic Fauna (l<br>a Aquatic Pla<br>rogen Sulfid<br>dized Rhizos<br>)<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>uge or Well I<br>er (Explain in<br>X _ Depth<br>X _ Depth | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duction in T<br>ace (C7)<br>Data (D9)<br>n Remarks<br>(inches):<br>(inches):               | Se<br>                                 | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted or S<br>X Geomorphic<br>FAC-Neutra                            | ators (minimum of two requin<br>il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>rrrows (C3)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)<br>al Test (D5)<br>nd<br>logy |
| YDROLC<br>Vetland Hyc<br>fimary India<br>Surface V<br>High Wal<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mal<br>Iron Dep<br>Inundatio<br>Sparsely<br>Water-Sl<br>ield Obser<br>Surface wate<br>Vater table<br>Saturation p                | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>at Deposits (B2)<br>posits (B3)<br>it or Crust (B4)<br>osits (B5)<br>on Visible on Aeria<br>Vegetated Conca-<br>tained Leaves (B4)<br>vations:<br>er present?<br>present?                                           | orphic po<br>ors:<br><u>n of one is</u><br>al Imagery<br>ave Surfac<br>9)<br>Yes | (B7)           | heck all the Aque Aque Aque Aque Aque Aque Aque Aqu              | and veget<br><u>at apply</u> )<br>atic Fauna (l<br>a Aquatic Pla<br>rogen Sulfid<br>dized Rhizos<br>)<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>uge or Well I<br>er (Explain in<br>X _ Depth<br>X _ Depth | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duction in T<br>ace (C7)<br>Data (D9)<br>n Remarks<br>(inches):                            | <u>Se</u><br>                          | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted or S<br>X Geomorphic<br>FAC-Neutra                            | ators (minimum of two requin<br>il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>rrrows (C3)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)<br>al Test (D5)<br>nd         |
| YDROLC<br>Vetland Hyc<br>rimary India<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mai<br>Iron Dep<br>Inundatio<br>Sparsely<br>Water-Sl<br>ield Obser<br>Surface wate<br>Vater table<br>Saturation p<br>includes ca | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>to Deposits (B2)<br>posits (B3)<br>it or Crust (B4)<br>osits (B5)<br>on Visible on Aerie<br>Vegetated Conce<br>tained Leaves (B9<br>vations:<br>er present?<br>present?<br>present?<br>pillary fringe) | al Imagery<br>ave Surfac<br>9)<br>Yes<br>Yes<br>Yes                              | (B7)<br>e (B8) | heck all the Aque Aque Aque Aque Aque Aque Aque Aqu              | and veget<br>at apply)<br>atic Fauna (i<br>a Aquatic Pla<br>rogen Sulfid<br>dized Rhizos<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>roge or Well I<br>er (Explain in<br>X Depth<br>Depth<br>Depth<br>Depth | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duced Iron<br>duction in T<br>ace (C7)<br>Data (D9)<br>n Remarks<br>(inches):<br>(inches): | Se<br>                                 | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted or S<br>X Geomorphic<br>FAC-Neutra<br>Wetla<br>hydro<br>prese | ators (minimum of two requin<br>il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>rrrows (C3)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)<br>al Test (D5)<br>nd<br>logy |
| YDROLC<br>Vetland Hyc<br>rimary India<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mai<br>Iron Dep<br>Inundatio<br>Sparsely<br>Water-Sl<br>ield Obser<br>Surface wate<br>Vater table<br>Saturation p<br>includes ca | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>at Deposits (B2)<br>posits (B3)<br>it or Crust (B4)<br>osits (B5)<br>on Visible on Aeria<br>Vegetated Conca-<br>tained Leaves (B4)<br>vations:<br>er present?<br>present?                                           | al Imagery<br>ave Surfac<br>9)<br>Yes<br>Yes<br>Yes                              | (B7)<br>e (B8) | heck all the Aque Aque Aque Aque Aque Aque Aque Aqu              | and veget<br>at apply)<br>atic Fauna (i<br>a Aquatic Pla<br>rogen Sulfid<br>dized Rhizos<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>roge or Well I<br>er (Explain in<br>X Depth<br>Depth<br>Depth<br>Depth | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duced Iron<br>duction in T<br>ace (C7)<br>Data (D9)<br>n Remarks<br>(inches):<br>(inches): | Se<br>                                 | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted or S<br>X Geomorphic<br>FAC-Neutra<br>Wetla<br>hydro<br>prese | ators (minimum of two requin<br>il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>rrrows (C3)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)<br>al Test (D5)<br>nd<br>logy |
| YDROLC<br>Vetland Hyc<br>rimary India<br>Surface V<br>High Wat<br>X Saturatio<br>Water Ma<br>Sedimen<br>Drift Dep<br>Algal Mai<br>Iron Dep<br>Inundatio<br>Sparsely<br>Water-Sl<br>ield Obser<br>Surface wate<br>Vater table<br>Saturation p<br>includes ca | DGY<br>drology Indicate<br>cators (minimum<br>Water (A1)<br>ter Table (A2)<br>on (A3)<br>arks (B1)<br>arks (B1)<br>to Deposits (B2)<br>posits (B3)<br>it or Crust (B4)<br>osits (B5)<br>on Visible on Aerie<br>Vegetated Conce<br>tained Leaves (B9<br>vations:<br>er present?<br>present?<br>present?<br>pillary fringe) | al Imagery<br>ave Surfac<br>9)<br>Yes<br>Yes<br>Yes                              | (B7)<br>e (B8) | heck all the Aque Aque Aque Aque Aque Aque Aque Aqu              | and veget<br>at apply)<br>atic Fauna (i<br>a Aquatic Pla<br>rogen Sulfid<br>dized Rhizos<br>sence of Red<br>xent Iron Red<br>)<br>n Muck Surfa<br>roge or Well I<br>er (Explain in<br>X Depth<br>Depth<br>Depth<br>Depth | ation.<br>B13)<br>ants (B14)<br>e Odor (C1<br>pheres on<br>duced Iron<br>duced Iron<br>duction in T<br>ace (C7)<br>Data (D9)<br>n Remarks<br>(inches):<br>(inches): | Se<br>                                 | condary Indica<br>Surface Soi<br>Drainage P.<br>Dry-Season<br>Crayfish Bu<br>X Saturation V<br>Stunted or S<br>X Geomorphic<br>FAC-Neutra<br>Wetla<br>hydro<br>prese | ators (minimum of two requin<br>il Cracks (B6)<br>atterns (B10)<br>n Water Table (C2)<br>rrrows (C3)<br>Visible on Aerial Imagery (C9)<br>Stressed Plants (D1)<br>c Position (D2)<br>al Test (D5)<br>nd<br>logy |

US Army Corps of Engineers

Midwest Region

## WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                               | City/C      | County:             | Waukegan/L    | ake Sampling Date: 5-2-12                                |
|---------------------------------------------------------------|-------------|---------------------|---------------|----------------------------------------------------------|
| Applicant/Owner: NSG                                          | Ŧ           | State:              | Illinois      | Sampling Point: 7                                        |
| Investigator(s): Hey and Associates (Kuykendall/Mosca)        | )           | Sectio              | on, Township, | Range: S 15, T 45N, R 12E                                |
| Landform (hillslope, terrace, etc.):                          |             | Local re            | lief (concave | , convex, none): Concave                                 |
| Slope (%): Lat: 42.372665                                     |             |                     |               | 5Datum:                                                  |
| Soil Map Unit Name 802B loamy                                 |             |                     |               | assification:                                            |
| Are climatic/hydrologic conditions of the site typical for th | nis time of | f the year?         | Y (lf         | no, explain in remarks)                                  |
| Are vegetation Y , soil Y , or hydrolog                       |             | •                   |               |                                                          |
| Are vegetation , soil , or hydrology                          |             |                     |               | Are "normal circumstances"<br>present? N                 |
| SUMMARY OF FINDINGS                                           | , <u> </u>  | ····· <b>/</b> ···· |               | (If needed, explain any answers in remarks.)             |
| Hydrophytic vegetation present? Y                             |             |                     |               |                                                          |
| Hydric soil present? Y                                        | 1           | le thais:           | ampled area   | within a wetlan: Y                                       |
| Wetland hydrology present? Y                                  |             |                     |               | I site ID:                                               |
|                                                               |             |                     |               |                                                          |
| Remarks: (Explain alternative procedures here or in a se      | •           | • •                 |               |                                                          |
| The subject property is a former manufactured gas             |             |                     |               |                                                          |
| remediation in the past. The property                         |             | ntain various       | depins of fi  | I material & contaminated soil.                          |
| VEGETATION Use scientific names of plants.                    | •           |                     | ·             |                                                          |
|                                                               |             | Dominan             | Indicator     | Dominance Test Worksheet                                 |
| · · · · · · · · · · · · · · · · · · ·                         |             | t Species           | Staus         | Number of Dominant Species                               |
| 1 Fraxinus pennsylvanica                                      | 10          | Y                   | FACW          | that are OBL, FACW, or FAC: 7 (A)                        |
| 2 Populus delloides                                           |             | <u> </u>            | FAC           | Total Number of Dominant                                 |
| 3                                                             | <u> </u>    |                     | <u> </u>      | Species Across all Strata: 8 (B)                         |
| 4                                                             |             |                     |               | Percent of Dominant Species                              |
| 5                                                             |             |                     |               | that are OBL, FACW, or FAC: 87.50% (A/B)                 |
|                                                               | 20          | = Total Cover       | r i           |                                                          |
| Sapling/Shrub stratun (Plot size:) 1 Cornus stolonifera       | 20          | Y                   | FACW          | Prevalence Index Worksheet<br>Total % Cover of:          |
| 2 Rhamnus cathartica                                          | 20          |                     | FAC           | OBL species 0 x1 ≈ 0                                     |
| 3 Rhamnus frangula                                            | 20          | <br>Y               | FAC           | FACW species $30 \times 2 = 60$                          |
| 4                                                             |             | '                   |               | FAC species $65 \times 3 = 195$                          |
| 5                                                             | <u> </u>    |                     |               | FACU species $0 \times 4 = 0$                            |
|                                                               | 60          | - Total Cove        |               | UPL species $0 \times 5 = 0$                             |
| Herb stratum (Plot size:)                                     |             |                     |               | Column totals 95 (A) 255 (B)                             |
| 1 Smilacina stellata                                          | 10          | Y                   | FAC           | Prevalence Index = B/A = 2.68                            |
| 2 Hemerocallis fulva                                          | 10          | Y                   | Nł            | ·                                                        |
| 3 Geum canadense                                              | 5           | Y                   | FAC           | Hydrophytic Vegetation Indicators:                       |
| 4                                                             |             |                     |               | Rapid test for hydrophytic vegetation                    |
| 5                                                             |             |                     |               | X Dominance test is >50%                                 |
| 6                                                             |             |                     |               | X Prevalence index is ≤3.0*                              |
| 7                                                             |             |                     |               | Morphogical adaptations* (provide                        |
| 8                                                             |             |                     |               | supporting data in Remarks or on a                       |
| 9                                                             |             |                     |               | separate sheet)                                          |
| 10                                                            |             | ·                   |               | Problematic hydrophytic vegetation*                      |
| -                                                             | 25          | ≈ Total Cove        | r             | (explain)                                                |
| Woody vine stratum (Plot size:)                               |             |                     |               | *Indicators of hydric soil and wetland hydrology must be |
| 1                                                             |             |                     |               | present, unless disturbed or problematic                 |
| 2                                                             |             |                     |               | Hydrophytic<br>vegetation                                |
|                                                               | 0           | = Total Cove        | 1             | present? Y                                               |
| Remarks: (include photo numbers here or on a separat          | e sheet     |                     |               |                                                          |
|                                                               | o oneoy     |                     |               |                                                          |

|                                                                                                                                                                                                                                                                                                      | cription: (Descri                                                                                                                                                                                                                                                                                                                                           | ibe to th                                                                                | ie depth       | needed                                 | to docu                                                                                                                              | ment the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | e indicato                                                                                                                                          | or or confirm                            | the abs                                                             | ence of indicators.)                                                                                                                                                                                                                                                                              |
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| Depth                                                                                                                                                                                                                                                                                                | Matrix                                                                                                                                                                                                                                                                                                                                                      |                                                                                          |                |                                        | dox Feat                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     |                                          |                                                                     | ,                                                                                                                                                                                                                                                                                                 |
| (Inches)                                                                                                                                                                                                                                                                                             | Color (moist)                                                                                                                                                                                                                                                                                                                                               | %                                                                                        | Color          | (moist)                                | %                                                                                                                                    | Type*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Loc**                                                                                                                                               | Tex                                      | ture                                                                | Remarks                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                      | See                                                                                                                                                                                                                                                                                                                                                         |                                                                                          |                |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     |                                          |                                                                     |                                                                                                                                                                                                                                                                                                   |
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|                                                                                                                                                                                                                                                                                                      | Concentration, D                                                                                                                                                                                                                                                                                                                                            | = Deplet                                                                                 | ion, RM        | ≈ Reduc                                | ed Matrix                                                                                                                            | k, MS = N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Masked S                                                                                                                                            |                                          |                                                                     | ation: PL = Pore Lining, M = Matri                                                                                                                                                                                                                                                                |
| Hydric Se                                                                                                                                                                                                                                                                                            | oil Indicators:                                                                                                                                                                                                                                                                                                                                             |                                                                                          |                |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | •                                                                                                                                                   | Indicate                                 | ors for Pr                                                          | oblematic Hydric Soils:                                                                                                                                                                                                                                                                           |
| His                                                                                                                                                                                                                                                                                                  | tisol (A1)                                                                                                                                                                                                                                                                                                                                                  |                                                                                          |                | Sa                                     | nd <b>y Gley</b>                                                                                                                     | ed Matrix                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | c (S4)                                                                                                                                              | Coa                                      | ist Prairie                                                         | Redox (A16) (LRR K <b>, L, R</b> )                                                                                                                                                                                                                                                                |
| His                                                                                                                                                                                                                                                                                                  | tic Epipedon (A2)                                                                                                                                                                                                                                                                                                                                           |                                                                                          |                | Sa                                     | ndy Reda                                                                                                                             | ox (S5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                     | Dar                                      | k Surface                                                           | (S7) (LRR K, L)                                                                                                                                                                                                                                                                                   |
| Bla                                                                                                                                                                                                                                                                                                  | ck Histic (A3)                                                                                                                                                                                                                                                                                                                                              |                                                                                          |                | Stri                                   | ipped Ma                                                                                                                             | atrix (S6)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                     | 5 ci                                     | n Mucky I                                                           | Peat or Peat (S3) (LRR K, L, R)                                                                                                                                                                                                                                                                   |
| Hy                                                                                                                                                                                                                                                                                                   | trogen Sulfide (A4                                                                                                                                                                                                                                                                                                                                          | 4)                                                                                       |                | Loa                                    | amy Muc                                                                                                                              | ky Minera                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | al (F1)                                                                                                                                             | lron                                     | -Mangan                                                             | ese Masses (F12) (LRR K, L, R)                                                                                                                                                                                                                                                                    |
| Str                                                                                                                                                                                                                                                                                                  | atified Layers (A5)                                                                                                                                                                                                                                                                                                                                         | )                                                                                        |                | Loa                                    | amy Gley                                                                                                                             | ed Matri                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | x (F2)                                                                                                                                              | Ver                                      | y Shallow                                                           | Dark Surface (TF12)                                                                                                                                                                                                                                                                               |
| 2 c                                                                                                                                                                                                                                                                                                  | m Muck (A10)                                                                                                                                                                                                                                                                                                                                                |                                                                                          |                | De                                     | pleted M                                                                                                                             | atrix (F3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | )                                                                                                                                                   | Oth                                      | er (explai                                                          | in in remarks)                                                                                                                                                                                                                                                                                    |
| De                                                                                                                                                                                                                                                                                                   | pleted Below Darl                                                                                                                                                                                                                                                                                                                                           | k Surface                                                                                | e (A11)        | Re                                     | dox Dark                                                                                                                             | surface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | • (F6)                                                                                                                                              |                                          |                                                                     |                                                                                                                                                                                                                                                                                                   |
| Thi                                                                                                                                                                                                                                                                                                  | ck Dark Surface (                                                                                                                                                                                                                                                                                                                                           | (A12)                                                                                    |                | De                                     | pleted D                                                                                                                             | ark Surfa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ice (F7)                                                                                                                                            | *Indi                                    | patore of I                                                         | hydrophytic vegetation and welland                                                                                                                                                                                                                                                                |
| Sa                                                                                                                                                                                                                                                                                                   | nd <b>y Mucky Minera</b>                                                                                                                                                                                                                                                                                                                                    | al (S1)                                                                                  |                | Re                                     | dox Dep                                                                                                                              | ressions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (F8)                                                                                                                                                |                                          |                                                                     | ist be present, unless disturbed or                                                                                                                                                                                                                                                               |
| 5 c                                                                                                                                                                                                                                                                                                  | m Mucky Peat or !                                                                                                                                                                                                                                                                                                                                           | Peat (S3                                                                                 | 3)             |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     | ,                                        |                                                                     | problematic                                                                                                                                                                                                                                                                                       |
| lestrictive                                                                                                                                                                                                                                                                                          | Layer (if observe                                                                                                                                                                                                                                                                                                                                           | ed):                                                                                     |                |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | T                                                                                                                                                   |                                          |                                                                     |                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                             |                                                                                          |                |                                        |                                                                                                                                      | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                     |                                          |                                                                     |                                                                                                                                                                                                                                                                                                   |
| Remarks:<br>The sub                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                             |                                                                                          |                |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     | were not s                               | ampled.                                                             | Soils are assumed to be                                                                                                                                                                                                                                                                           |
| Remarks:<br>The sub<br>hydric b                                                                                                                                                                                                                                                                      | ject property co<br>ased on geomo                                                                                                                                                                                                                                                                                                                           |                                                                                          |                |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     | were not s                               | ampled.                                                             | Soils are assumed to be                                                                                                                                                                                                                                                                           |
| Remarks:<br>The sub<br>hydric b                                                                                                                                                                                                                                                                      | ject property co<br>ased on geomo<br>DGY                                                                                                                                                                                                                                                                                                                    | orphic p                                                                                 |                |                                        |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                     | were not s                               | ampled.                                                             | Soils are assumed to be                                                                                                                                                                                                                                                                           |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy                                                                                                                                                                                                                                              | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato                                                                                                                                                                                                                                                                                               | orphic p                                                                                 | bosition       | , hydrol                               | ogy and                                                                                                                              | l vegeta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                     |                                          |                                                                     |                                                                                                                                                                                                                                                                                                   |
| Remarks:<br>The sub<br>hydric b<br>IYDROL<br>Vetland Hy<br>Primary Ind                                                                                                                                                                                                                               | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum                                                                                                                                                                                                                                                                            | orphic p                                                                                 | bosition       | , hydrol                               | ogy and                                                                                                                              | l vegeta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ation.<br>                                                                                                                                          |                                          | Secondar                                                            | y Indicators (minimum of two regul                                                                                                                                                                                                                                                                |
| The sub<br>hydric b<br>IYDROL<br>Vetland Hy<br>Yrimary Ind<br>Surface                                                                                                                                                                                                                                | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)                                                                                                                                                                                                                                                              | orphic p                                                                                 | bosition       | , hydrol                               | ogy and<br><u>all that a</u><br>Aquatic                                                                                              | l vegeta                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ation.                                                                                                                                              |                                          | Secondar<br>Surf                                                    | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)                                                                                                                                                                                                                                        |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W                                                                                                                                                                                                          | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicator<br>icators (minimum<br>Water (A1)<br>ater Table (A2)                                                                                                                                                                                                                                         | orphic p                                                                                 | bosition       | , hydrol                               | ogy and<br><u>all that a</u><br>_ Aquatic<br>_ True Ac                                                                               | l vegeta<br>apply)<br>Fauna (E<br>quatic Pla                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ation.<br>313)<br>nts (B14)                                                                                                                         | <u></u>                                  | Secondar<br>Surf<br>Drai                                            | y Indicators (minimum of two regul<br>ace Soil Cracks (B6)<br>nage Patterns (B10)                                                                                                                                                                                                                 |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati                                                                                                                                                                                              | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)                                                                                                                                                                                                                               | orphic p                                                                                 | bosition       | , hydrol                               | ogy and<br><u>all that a</u><br>Aquatic<br>True Ac<br>Hydrog                                                                         | l vegeta<br>apply)<br>Fauna (E<br>quatic Plan<br>en Sulfide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ation.<br>313)<br>nts (B14)<br>e Odor (C1                                                                                                           | <u></u>                                  | Secondan<br>Surf<br>Drai<br>Dry-                                    | <u>y Indicators (minimum of two regul</u><br>ace Soil Cracks (B6)<br>nage Patierns (B10)<br>Season Water Tabla (C2)                                                                                                                                                                               |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water N                                                                                                                                                                                   | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)                                                                                                                                                                                                                 | orphic p                                                                                 | bosition       | , hydrol                               | egy and<br><u>all that a</u><br>Aquatic<br>True Ac<br>Hydrog<br>Oxidize                                                              | l vegeta<br>apply)<br>Fauna (E<br>quatic Plan<br>en Sulfide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ation.<br>313)<br>nts (B14)<br>e Odor (C1                                                                                                           | <u></u>                                  | Secondar<br>Surf<br>Drai<br>Dry-<br>X Cray                          | <u>y Indicators (minimum of two regul</u><br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>₍ fish Burrows (C8)                                                                                                                                             |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime                                                                                                                                                                       | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)                                                                                                                                                                                              | orphic p                                                                                 | bosition       | , hydrol                               | ogy and<br><u>all that a</u><br>Aquatic<br>True Ac<br>Hydrog<br>Oxidize<br>(C3)                                                      | l vegeta<br>apply)<br>Fauna (E<br>guatic Plan<br>en Sulfide<br>d Rhizoss                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ation.<br>313)<br>nts (B14)<br>9 Odor (C1<br>pheres on                                                                                              | )<br>Living Roofs                        | Secondar<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu                  | <u>y Indicators (minimum of two regul</u><br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>Afish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)                                                                                                               |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Saturati<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De                                                                                                                                                        | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)                                                                                                                                                                               | orphic p                                                                                 | bosition       | , hydrol                               | egy and<br>all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu                                                 | J vegeta<br>apply)<br>Fauna (E<br>quatic Plan<br>en Sulfide<br>d Rhizosy<br>ce of Red                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ation.<br>313)<br>nts (B14)<br>a Odor (C1<br>pheres on<br>luced Iron                                                                                | )<br>Living Roots<br>(C4)                | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur          | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Vlsible on Aerial Imagery (C9)<br>Ned or Stressed Plants (D1)                                                                                       |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X<br>Sedime<br>X<br>Drift De<br>Algal M                                                                                                                                        | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)                                                                                                                                                          | orphic p                                                                                 | bosition       | , hydrol                               | all that a<br>Aquatic<br>True Ac<br>Hydrogo<br>Oxidize<br>(C3)<br>Present<br>Recent                                                  | J vegeta<br>apply)<br>Fauna (E<br>quatic Plan<br>en Sulfide<br>d Rhizosy<br>ce of Red                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ation.<br>313)<br>nts (B14)<br>9 Odor (C1<br>pheres on                                                                                              | )<br>Living Roots<br>(C4)                | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patierns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>nied or Stressed Plants (D1)<br>morphic Position (D2)                                                             |
| The sub<br>hydric b<br>hydric b<br>hydric b<br>hydric b<br>HyDROL<br>Vetland Hy<br>Primary Ind<br>Saurati<br>Water M<br>Salurati<br>Water M<br>X<br>Sedime<br>X<br>Drift De<br>Algal M<br>Iron De                                                                                                    | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)                                                                                                                                            | orphic p<br>ors:<br>of one is                                                            | s require      | , hydrol                               | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>(C3)<br>Presenu<br>Recent<br>(C6)                                                     | J vegeta<br>apply)<br>Fauna (E<br>juatic Plan<br>en Sulfide<br>d Rhizosy<br>ce of Red<br>Iron Red                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ation.<br>B13)<br>Ints (B14)<br>a Odor (C1<br>pheres on<br>luced Iron<br>uction in T                                                                | )<br>Living Roots<br>(C4)                | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Vlsible on Aerial Imagery (C9)<br>Ned or Stressed Plants (D1)                                                                                       |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>Algal M<br>Iron De<br>Inundat                                                                                                                                      | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria                                                                                                                    | orphic p<br>ors:<br>of one is                                                            | y (B7)         | , hydrol                               | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Present<br>Recent<br>(C6)                                          | J vegeta<br>apply)<br>Fauna (E<br>guatic Plan<br>en Sulfide<br>d Rhizosy<br>ce of Red<br>Iron Red<br>uck Surfa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction in T<br>cce (C7)                                                    | )<br>Living Roots<br>(C4)                | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patierns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>nied or Stressed Plants (D1)<br>morphic Position (D2)                                                             |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel                                                                                                             | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conce                                                                                                | orphic p<br>ors:<br>of one is<br>al Imager<br>ave Surfa                                  | y (B7)         | , hydrol                               | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Present<br>Recent<br>(C6)<br>Thin Mu<br>Gauge                      | J vegeta<br>apply)<br>Fauna (E<br>guatic Platen<br>Sulfide<br>d Rhizoss<br>d Rhizoss<br>ce of Red<br>Iron Red<br>uck Surfa<br>or Well D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ation,<br>B13)<br>Ints (B14)<br>9 Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>Ice (C7)<br>Data (D9)                                       | )<br>Living Roots<br>(C4)<br>illed Solls | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patierns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>nied or Stressed Plants (D1)<br>morphic Position (D2)                                                             |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Vetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water N<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S                                                                                                  | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conca<br>Stained Leaves (B9)                                                                         | orphic p<br>ors:<br>of one is<br>al Imager<br>ave Surfa                                  | y (B7)         | , hydrol                               | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Present<br>Recent<br>(C6)<br>Thin Mu<br>Gauge                      | J vegeta<br>apply)<br>Fauna (E<br>guatic Platen<br>Sulfide<br>d Rhizoss<br>d Rhizoss<br>ce of Red<br>Iron Red<br>uck Surfa<br>or Well D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction in T<br>cce (C7)                                                    | )<br>Living Roots<br>(C4)<br>illed Solls | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patierns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>nied or Stressed Plants (D1)<br>morphic Position (D2)                                                             |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water-S<br>Field Obse                                                                                    | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conca<br>Stained Leaves (B9)                                                                         | orphic p<br>ors:<br>of one is<br>al Imager<br>ave Surfa                                  | y (B7)         | , hydrol                               | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Present<br>Recent<br>(C6)<br>Thin Mu<br>Gauge                      | J vegeta<br>apply)<br>Fauna (E<br>quatic Plar<br>en Sulfide<br>d Rhizoss<br>d  Rhizoss<br>d Rhizoss<br>d Rhizo | ation,<br>B13)<br>Ints (B14)<br>9 Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>Ice (C7)<br>Data (D9)                                       | )<br>Living Roots<br>(C4)<br>illed Solls | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patierns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>nied or Stressed Plants (D1)<br>morphic Position (D2)                                                             |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water S<br>Field Obse<br>Surface wa<br>Water table                                                       | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B9<br>rvations:<br>ter present?                                            | orphic p<br>ors:<br>of one is<br>of one is<br>al Imager<br>ave Surfa<br>))<br>Yes<br>Yes | y (B7)         | , hydrol<br><u>d: check</u><br><u></u> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Present<br>(C6)<br>Thin Mu<br>Gauge<br>Other (U                    | J vegeta<br>apply)<br>Fauna (E<br>guatic Platen<br>Sulfide<br>d Rhizoss<br>d Rhizoss<br>ce of Red<br>iron Red<br>uck Surfa<br>or Well D<br>Explain in<br>Depth<br>Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>ce (C7)<br>Data (D9)<br>I Remarks<br>(inches):<br>(inches): | )<br>Living Roots<br>(C4)<br>illed Solls | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>vish Burrows (C8)<br>rration Visible on Aerial Imagery (C9)<br>ted or Stressed Plants (D1)<br>morphic Position (D2)<br>C-Neutral Test (D5)<br>Wetland<br>hydrology                |
| hydric b<br>HYDROLd<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water S<br>Field Obse<br>Surface wa<br>Water table<br>Saturation                                                               | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conca<br>Stained Leaves (B9<br>rvations:<br>ter present?<br>present?                                | orphic p<br>ors:<br>of one is<br>of one is<br>al Imager<br>ave Surfa<br>))<br>Yes        | y (B7)         | , hydrol<br><u>d: check</u><br><u></u> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge<br>Other (           | J vegeta<br>apply)<br>Fauna (E<br>guatic Platen<br>Sulfide<br>d Rhizoss<br>d Rhizoss<br>ce of Red<br>iron Red<br>uck Surfa<br>or Well D<br>Explain in<br>Depth<br>Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>ce (C7)<br>Data (D9)<br>I Remarks<br>(inches):              | )<br>Living Roots<br>(C4)<br>illed Solls | Secondan<br>Surf<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>vish Burrows (C8)<br>rration Visible on Aerial Imagery (C9)<br>ned or Stressed Plants (D1)<br>morphic Position (D2)<br>-Neutral Test (D5)<br>Wetland                              |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Iron De<br>Iron De<br>Sparsel<br>Water S<br>Field Obse<br>Surface wa<br>Water table<br>Saturation I<br>(includes c | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B9<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imager<br>al Imager<br>ave Surfa<br>))<br>Yes<br>Yes<br>Yes                           | y (B7)<br>(B7) | , hydrol<br><u>d: check</u><br><u></u> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge<br>Other (<br>X<br>X | J vegeta<br>apply)<br>Fauna (E<br>guatic Plar<br>en Sulfide<br>d Rhizoss<br>ce of Red<br>iron Red<br>uck Surfa<br>or Well D<br>Explain in<br>Depth<br>Depth<br>Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>ce (C7)<br>bata (D9)<br>I Remarks<br>(inches):<br>(inches): | )<br>Living Roofs<br>(C4)<br>illed Soils | Secondan<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo<br>FAC  | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>ted or Stressed Plants (D1)<br>morphic Position (D2)<br>2-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? Y |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Iron De<br>Iron De<br>Sparsel<br>Water S<br>Field Obse<br>Surface wa<br>Water table<br>Saturation I<br>(includes c | ject property co<br>ased on geomo<br>DGY<br>rdrology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conca<br>Stained Leaves (B9<br>rvations:<br>ter present?                                            | al Imager<br>al Imager<br>ave Surfa<br>))<br>Yes<br>Yes<br>Yes                           | y (B7)<br>(B7) | , hydrol<br><u>d: check</u><br><u></u> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge<br>Other (<br>X<br>X | J vegeta<br>apply)<br>Fauna (E<br>guatic Plar<br>en Sulfide<br>d Rhizoss<br>ce of Red<br>iron Red<br>uck Surfa<br>or Well D<br>Explain in<br>Depth<br>Depth<br>Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>ce (C7)<br>bata (D9)<br>I Remarks<br>(inches):<br>(inches): | )<br>Living Roofs<br>(C4)<br>illed Soils | Secondan<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo<br>FAC  | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>ted or Stressed Plants (D1)<br>morphic Position (D2)<br>2-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? Y |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water S<br>Field Obse<br>Surface wa<br>Water table<br>Saturation I<br>(includes c                        | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B9<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imager<br>al Imager<br>ave Surfa<br>))<br>Yes<br>Yes<br>Yes                           | y (B7)<br>(B7) | , hydrol<br><u>d: check</u><br><u></u> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge<br>Other (<br>X<br>X | J vegeta<br>apply)<br>Fauna (E<br>guatic Plar<br>en Sulfide<br>d Rhizoss<br>ce of Red<br>iron Red<br>uck Surfa<br>or Well D<br>Explain in<br>Depth<br>Depth<br>Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>ce (C7)<br>bata (D9)<br>I Remarks<br>(inches):<br>(inches): | )<br>Living Roofs<br>(C4)<br>illed Soils | Secondan<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo<br>FAC  | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>ted or Stressed Plants (D1)<br>morphic Position (D2)<br>2-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? Y |
| Remarks:<br>The sub<br>hydric b<br>HYDROL<br>Wetland Hy<br>Primary Ind<br>Surface<br>High W<br>Saturati<br>Water M<br>X Sedime<br>X Drift De<br>Algal M<br>Iron De<br>Inundat<br>Sparsel<br>Water S<br>Field Obse<br>Surface wa<br>Water table<br>Saturation I<br>(includes c                        | ject property co<br>ased on geomo<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conce<br>Stained Leaves (B9<br>rvations:<br>ter present?<br>present?<br>present?<br>apillary fringe) | al Imager<br>al Imager<br>ave Surfa<br>))<br>Yes<br>Yes<br>Yes                           | y (B7)<br>(B7) | , hydrol<br><u>d: check</u><br><u></u> | all that a<br>Aquatic<br>True Ac<br>Hydrogu<br>Oxidize<br>(C3)<br>Presenu<br>Recent<br>(C6)<br>Thin Mu<br>Gauge<br>Other (<br>X<br>X | J vegeta<br>apply)<br>Fauna (E<br>guatic Plar<br>en Sulfide<br>d Rhizoss<br>ce of Red<br>iron Red<br>uck Surfa<br>or Well D<br>Explain in<br>Depth<br>Depth<br>Depth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ation.<br>B13)<br>Ints (B14)<br>B Odor (C1<br>pheres on<br>luced Iron<br>uction In T<br>ce (C7)<br>bata (D9)<br>I Remarks<br>(inches):<br>(inches): | )<br>Living Roofs<br>(C4)<br>illed Soils | Secondan<br>Drai<br>Dry-<br>X Cray<br>Satu<br>Stur<br>X Geo<br>FAC  | y Indicators (minimum of two requi<br>ace Soil Cracks (B6)<br>nage Patterns (B10)<br>Season Water Tabla (C2)<br>(fish Burrows (C8)<br>Iration Visible on Aerial Imagery (C9)<br>ted or Stressed Plants (D1)<br>morphic Position (D2)<br>2-Neutral Test (D5)<br>Wetland<br>hydrology<br>present? Y |

**Midwest Region** 

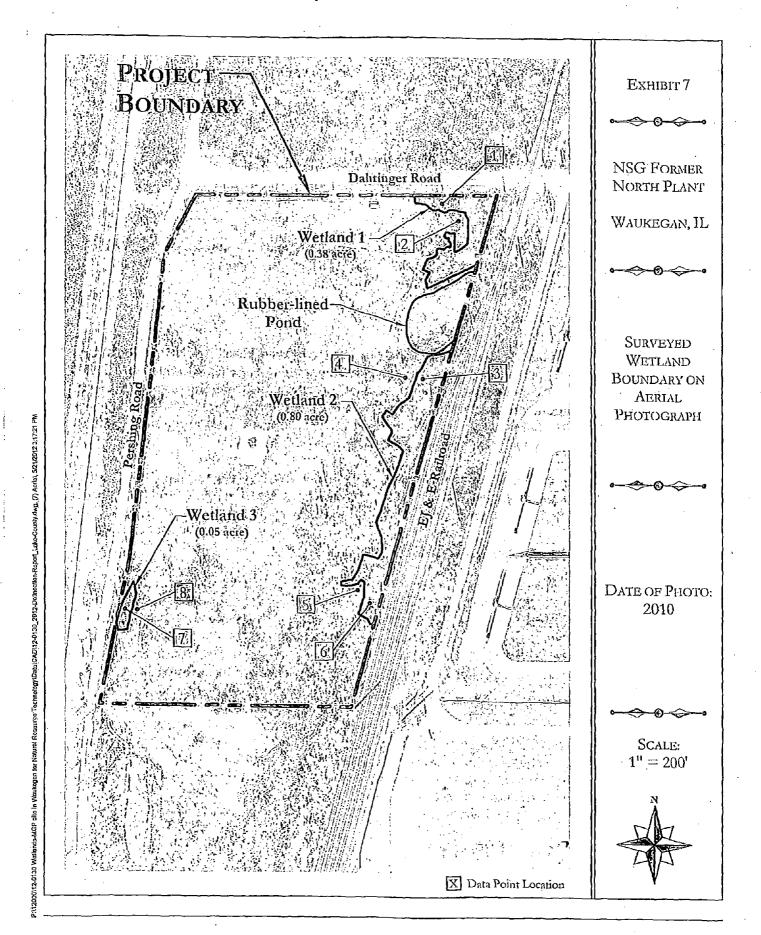
## WETLAND DETERMINATION DATA FORM - Midwest Region

| Project/Site:Former North Plant                                                    | City/C                          | County:                      | Waukegan/La                        | ke Sampling Date:                                       | 5-2-12                                                |
|------------------------------------------------------------------------------------|---------------------------------|------------------------------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------|
| Applicant/Owner: NSG                                                               |                                 | State:                       | Illinois                           | Sampling Point:                                         | . 8                                                   |
| Investigator(s): Hey and Associates (Kuykendall/Mo                                 | osca)                           | Secti                        | on, Township,                      | Range: S 15,                                            | Γ45N, R 12E                                           |
| Landform (hillslope, terrace, etc.):                                               |                                 | Local r                      | elief (concave,                    | convex, none):                                          | none                                                  |
| Slope (%): Lat: 42.37270                                                           | )2                              | Long:                        | -87,825266                         | Datum;                                                  |                                                       |
| Soil Map Unit Name 802B loamy                                                      |                                 |                              | VWI CI                             | assification:                                           |                                                       |
| Are climatic/hydrologic conditions of the site typical i                           | for this time o                 | f the year?                  | Y ∈ (lfı                           | no, explain in remarks)                                 | <u> </u>                                              |
| Are vegetation Y, soil Y, or hydr                                                  | ology Y                         | significantl                 | y disturbed?                       | Are "normal circ                                        | "ennes                                                |
|                                                                                    | ology                           |                              | roblematic?                        |                                                         | present? N                                            |
| SUMMARY OF FINDINGS                                                                |                                 |                              |                                    | (If needed, explain any a                               | answers in remarks.)                                  |
| Hydrophytic vegetation present? Y                                                  |                                 | ·                            | · · · · · ·                        |                                                         |                                                       |
| Hydric soil present? Y                                                             |                                 | is the s                     | sampled area                       | within a wetlan:                                        | N                                                     |
| Wetland hydrology present? N                                                       | 1                               |                              | ptional wetland                    |                                                         |                                                       |
|                                                                                    | ł                               | ·                            |                                    |                                                         |                                                       |
| Remarks: (Explain alternative procedures here or in                                | -                               | -                            |                                    | - down of townstinutto                                  |                                                       |
| The subject property is a former manufactured<br>remediation in the past. The prop | d gas plant tr<br>berty may col | lat has und<br>Infain variou | ergone variou<br>is deoths of fill | s stages of investigation<br>I material & confamination | ), construction, and<br>ad soil'                      |
| VEGETATION Use scientific names of pla                                             |                                 |                              |                                    |                                                         |                                                       |
| VEGETATION Use scientific names of pla                                             |                                 |                              |                                    | Dominance Test Work                                     | choot                                                 |
| Tree Stratum (Plot size: )                                                         | Absolute<br>% Cover             | Dominan<br>t Species         | Indicator .<br>Staus               |                                                         |                                                       |
| 1 Populus deltoides                                                                | 20                              | Y                            | FAC                                | Number of Dominant Spe<br>that are OBL, FACW, or F      |                                                       |
| 2 Fraxinus pennsylvanica                                                           |                                 | Y                            | FACW                               | Total Number of Domi                                    |                                                       |
| 3 Robinia pseudoacacia                                                             | 10                              | Y                            | FACU                               | Species Across all St                                   |                                                       |
| 4                                                                                  |                                 |                              |                                    | Percent of Dominant Spe                                 |                                                       |
| 5                                                                                  |                                 |                              |                                    | that are OBL, FACW, or I                                |                                                       |
|                                                                                    | 40                              | = Total Cove                 | er                                 | · · ·                                                   | · <u> </u>                                            |
| Sapling/Shrub stratun (Plot size:                                                  | _)                              |                              | Γ                                  | Prevalence Index Wor                                    | ksheet                                                |
| 1 Rhamnus cathartica                                                               | 20                              | Y                            | FACU                               | Total % Cover of:                                       |                                                       |
| 2 Fraxinus pennsylvanica                                                           | 10                              | <u> </u>                     | FACW                               | OBL species 0                                           | x1=_0                                                 |
| 3 Lonicera tatarica                                                                | 10                              | Y                            | FACU                               | FACW species 20                                         | x 2 =40                                               |
| 4                                                                                  |                                 |                              |                                    | FAC species 40                                          | x3 = <u>120</u>                                       |
| 5                                                                                  |                                 |                              | ·                                  | FACU species                                            | _×4 =                                                 |
|                                                                                    | 40                              | = Total Cov                  | er                                 | UPL species 0                                           | x5 = 0                                                |
| Herb stratum (Plot size:                                                           | _) `                            | v                            | 540                                | Column totals 130                                       |                                                       |
| 1 <u>Alliaría petiolata</u>                                                        |                                 | - <u>- Y</u><br>- <u>Y</u> , | FAC<br>FACU                        | Prevalence Index = B/A                                  | (= <u>3.38</u>                                        |
| 2 Solidago altissima<br>3 Achillea millefolium                                     | <u></u>                         | Y                            | FACU                               | Hydrophytic Vegetatio                                   | n Indicators:                                         |
| 4                                                                                  | <u> </u>                        | ·                            |                                    | Rapid test for hydro                                    |                                                       |
| 5                                                                                  |                                 |                              | · ·                                | Dominance test is:                                      | • • •                                                 |
| 6                                                                                  | <u> </u>                        | • — <u> </u>                 | •                                  | Prevalence index is                                     |                                                       |
| 7                                                                                  |                                 |                              |                                    | ·                                                       |                                                       |
| 8                                                                                  |                                 |                              |                                    | Morphogical adapt<br>supporting data in                 |                                                       |
| 9                                                                                  |                                 |                              |                                    | separate sheet)                                         |                                                       |
| 10                                                                                 |                                 |                              |                                    | Problematic hydro                                       | ohytic vegetation*                                    |
|                                                                                    | 50                              | = Total Cov                  | ier                                | (explain)                                               | -                                                     |
| Woody vine stratum (Plot size:                                                     | )                               |                              | :                                  |                                                         | nd wetland hydrology must be<br>furbed or problematic |
| 2                                                                                  |                                 |                              | • • • • •                          | Hydrophytic                                             |                                                       |
|                                                                                    | 0                               | = Total Cov                  | /ei                                | vegetation<br>present?                                  | N                                                     |
|                                                                                    | <u> </u>                        |                              | ·                                  |                                                         | <u>N</u>                                              |
| Remarks: (Include photo numbers here or on a se                                    | parate sheet)                   |                              |                                    |                                                         |                                                       |

| See       Remarks         Below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Depth                                                                                                                                                                                                                                                    | Matrix                                                                                                                                                                                                                                                                                                             |                                                           |                       | needed to document the indicator or c<br>Redox Features |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Remarka       Below         Below       Below         Below       Below         Image: C = Concentration, D = Depletion, RM = Reduced Matix, MS = Masted Sand Grains.       **Location; PL = Pore Lining, M = Matry         rydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histisol (A1)       Sandy Glayed Matrix (S4)       Coast Pariline Redux (A16) (LR K, L, R)         Histisol (A1)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Hydrigen Sulfide (A4)       Loarny Mucky Mineral (F1)       Tion-Manganese Masses (F12) (LRR K, L, R)         Stratified Layers (A5)       Loarny Mucky Mineral (F1)       Tion-Manganese Masses (F12) (LRR K, L, R)         Depleted Below Dark Surface (A11)       Redox Depressions (F6)       Tion-Manganese Masses (F12) (LRR K, L, R)         Depleted Below Dark Surface (A12)       Depleted Dark Surface (F7)       *Indicators of hydrophytic vegetation and wellan hydrology must be present, unless disturbed on problematic hydrology must be present, unless disturbed on problematic hydrology indicators:         imary Indicators:       Hydric soil present?       Y         Pit (Inches):       Pit (Inches):       Hydric soil present?       Y         Pit (Inches):       Aquatic Fauna (B13)       Sacondary Indicators (minimum of two requested final Hydrology Indicators:       Sacondary Indicators (Cal)         Saturation Masin (B1) <t< th=""><th>(Inches)</th><th>Color (moist)</th><th>%</th><th>Color (m</th><th>ioisí)</th><th>%</th><th>Type*</th><th>Loc**</th><th>Textu</th><th>ure</th><th></th><th>Remarks</th></t<> | (Inches)                                                                                                                                                                                                                                                 | Color (moist)                                                                                                                                                                                                                                                                                                      | %                                                         | Color (m              | ioisí)                                                  | %                                                                                                                 | Type*                                                                                                                                                            | Loc**                                                                                                           | Textu                                                                                                                   | ure                                                                                    |                                                                                                                                                                                                                      | Remarks                                                                                                                   |
| Balow       Image: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M = Matrix (SA)         ype: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M = Matrix (SA)         Histic Epipedon (A2)       Sandy Gleyed Matrix (SA)       Coast Prairie Rodox (AFI) (LRR K, L, R)         Histic Epipedon (A2)       Sandy Redox (SS)       Deark Surface Rodox (Pretor Peak (S3) (LRR K, L, R)         Hydrogen Suffici (A4)       Loarny Mucky Mineral (F1)       Iron-Manganese Masses (F12) (LRR K, L, R)         Stratified Layers (A5)       Loarny Mucky Mineral (F1)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Derk Surface (F7)       "Indicators of hydrophytic vegetation and welian hydrology must be present, unless disturbed on problematic         Thick Dark Surface (T42)       Depleted Matrix (F2)       "Indicators of hydrophytic vegetation and welian hydrology must be present, unless disturbed on problematic         Stratific Layers (if observed):       Hydric soil present?       Y         pt:       Hydrology Indicators:       Hydric soil present?       Y         Stratae Welan       Aquatic Planta (B13)       Surface Soil Gracks (R6)       Drainage Paterns (B10)         Stratae Valer Table (A2)       True Aquatic Planta (B13)       Surface Soil Gracks (R6)       Drainage Paterns (B10)       Saturbaes Ont Gracks                                                                                                                 |                                                                                                                                                                                                                                                          | See                                                                                                                                                                                                                                                                                                                |                                                           | · · · ·               |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        | <u> </u>                                                                                                                                                                                                             |                                                                                                                           |
| ype: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M = Matrix         ype: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains.       "Location: PL = Pore Lining, M = Matrix         yrdit: Soil Indicators:       Indicators for Problematic Hydric Soils:         Histisol (A1)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histis (A3)       Stripped Matrix (S3)       Sorm Mucky Petor O Past (S3) (LRR K, L, R)         Black Histis (A3)       Stripped Matrix (S3)       Sorm Mucky Petor O Past (S3) (LRR K, L, R)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Depressions (F6)       Track Orthogy must be presont, unless disturbed or problematic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                          | Remarks                                                                                                                                                                                                                                                                                                            |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          | Below                                                                                                                                                                                                                                                                                                              |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      | ······································                                                                                    |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        | [ ···-                                                                                                                                                                                                               |                                                                                                                           |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          | ·                                                                                                                                                                                                                                                                                                                  |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        | {                                                                                                                                                                                                                    |                                                                                                                           |
| Hydric Soil Indicators:       Indicators for Problematic Hydric Soils:         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L, R)         Black Histic (A3)       Stripped Matrix (S6)       5 or Mucky Peet or Peet (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratilied Layers (A5)       Loarny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Depleted Matrix (F2)       Very Shallow Dark Surface (F12)       Other (explain in remarks)         Depleted Dark Surface (A12)       Depleted Dark Surface (F7)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         stripted (in observed):       per       Hydric soil present?       Y         pit (inches):       Hydric soil present?       Y         marks:       The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       Saturation (A3)       Hydragen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation Visite on Adrial Imagery (C9)         Sediment Deposits (B2)       (C3)       Presence of Reduced Iron (C4)       Sunface Strips Burrows (C2)         Seduration Ka3)                                                                                                                                                                                        |                                                                                                                                                                                                                                                          | Concentration D =                                                                                                                                                                                                                                                                                                  | = Depleti                                                 | ion RM = F            | Reduce                                                  | l<br>ed Matrix                                                                                                    | MS = M                                                                                                                                                           | lesked Sa                                                                                                       | and Grains                                                                                                              | **Locati                                                                               | $\mathbf{P} = \mathbf{P} \mathbf{C}$                                                                                                                                                                                 | na Lining M = Matri                                                                                                       |
| Histisol (A1)       Sandy Gleyed Matrix (S4)       Coast Prairie Redox (A16) (LRR K, L, R)         Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L)         Black Histic (A3)       Stripped Matrix (S6)       5 cm Mucky Peat or Peat (S3) (LRR K, L, R)         Hydrogen Sulfide (A4)       Learny Mucky Mineral (F1)       from-Manganese Masses (F12) (LRR K, L, R)         Stratified Layers (A5)       Loarny Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Depressions (F8)       Indicators of hydrophytic vegetation and weltan         Sandy Mucky Mineral (S1)       Redox Depressions (F8)       Indicators of hydrophytic vegetation and weltan         Strictive Layer (if observed):       pei       Hydric soil present?       Y         pit (inches):       Pei       Hydric soil present?       Y         pit (inches):       Pit (inches):       Y       Secondary Indicators (minimum of two request the strictive Layer (if observed):         pit       Aquatic Fanna (B13)       Surface Soil Cracks (B6)       Surface Soil Cracks (B6)         Mydrology Indicators:       True Aquatic Plants (B14)       Drainage Patterns (B10)       Saturation (K3)         Surface Water (A1)       Aquatic Fanna (B13)       Sur                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    | - Depiet                                                  |                       |                                                         | Su Main                                                                                                           | (, 10/0 1V                                                                                                                                                       | iaskeu Or                                                                                                       | · · · · · · · · · · · · · · · · · · ·                                                                                   |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Histic Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7) (LRR K, L)         Black Histic (A3)       Stripped Matrix (S5)       5 cm Mucky Pet or Peat (S3) (LRR K, L, R)         Hydrogen Sulfide (A4)       Loamy Mucky Mineral (F1)       Iron-Manganese Masses (F12) (LRR K, L, R)         Stratilide Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (F12)         2 cm Muck (A10)       Depleted Matrix (F2)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F6)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)         Sandy Mucky Mineral (S1)       Redox Depressions (F8)         Strictive Layer (if observed):       *         pet:       Hydric soil present?         ypt (inches):       *         emarks:       *         The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY       *         etiand Hydrology Indicators:       Surface Soil Cracks (86)         High Water Table (A2)       True Aquatic Plana (813)       Surface Soil Cracks (86)         High Water Table (A2)       True Aquatic Plana (813)       Surface Soil Cracks (86)         High Water Table (A3)       Cracks (B6)       Saturation Yaish Burrows (C8)         Sediment Depo                                                                                                                                                                                                                                                                                     | •                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                    |                                                           |                       | Sar                                                     | ndv Glev                                                                                                          | ed Matrix                                                                                                                                                        | (\$4)                                                                                                           |                                                                                                                         |                                                                                        | -                                                                                                                                                                                                                    |                                                                                                                           |
| Black Histic (A3)       Stripped Matrix (S6)       5 cm Mucky Peat or Peat (S3) (LRR K, L, R)         Hydrogen Suffice (A4)       Loamy Mucky Mineral (F1)       Iron-Manganese Masses (F12) (LRR K, L, R)         Stratified Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (F12)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A12)       Depleted Dark Surface (F6)       Thick Dark Surface (A12)         Strictive Layer (if observed):       Redox Depressions (F8)       "Indicators of hydrophytic vegetation and weitan hydrology must be present, unless disturbed or problematic         strictive Layer (if observed):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                          | • •                                                                                                                                                                                                                                                                                                                |                                                           |                       | _                                                       |                                                                                                                   |                                                                                                                                                                  | . (04)                                                                                                          |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      | -                                                                                                                         |
| Hydrogen Sulfide (A4)       Loamy Mucky Mineral (F1)       Iron-Manganese Masses (F12) (LRR K, L, R)         Stratified Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A12)       Depleted Matrix (F3)       Other (explain in remarks)         Thick Dark Surface (A12)       Depleted Matrix (F3)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         5 cm Mucky Peat or Peat (S3)       Redox Depressions (F8)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         perimetric       Hydric soil present?       Y         pipth (inches):       Hydric soil present?       Y         marks:       Hydrology Indicators:       Y         Myric.       Secondary Indicators (minimum of two requiption of two requiption of two requiption of two requiption of two requiption of two requiption of two requiption of two requiption of two requiption of two requiption of two requiption of the start apply.         Surface Water (A1)       Aquatic Plants (B14)       Drainage Patterns (B10)         Surface Water (A1)       Aquatic Plants (B14)       Drainage Patterns (B10)         Surface (A3)       Hydrogen Sulfde Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B                                                                                                                                                   |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         | -                                                                                      | •••                                                                                                                                                                                                                  | •                                                                                                                         |
| Stratilied Layers (A5)       Loamy Gleyed Matrix (F2)       Very Shallow Dark Surface (TF12)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F6)       Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or of 6 cm Mucky Peat or Peat (S3)       Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         strictive Layer (if observed):       Perturn (if observed):       Y         pet (inches):       Hydric soil present?       Y         strictive Layer (if observed):       Y       Y         pet (inches):       Hydric soil present?       Y         strictive Layer (if observed):       Y       Y         pet (inches):       Hydric soil present?       Y         stratind Hydrology Indicators:       Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Crecks (B6)         High Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)       Drainage Patterns (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)       Ordyfish Burtws (C8)         Sediment Deposits (B2)       (C3)       Presence of Raduced iron (C4)       Stantation Visible on Aerial Imagery (G2)         Stantation Visible on Aerial Imagery (G7)                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    | 1)                                                        | _                     |                                                         |                                                                                                                   |                                                                                                                                                                  | al (E1)                                                                                                         |                                                                                                                         | -,                                                                                     | -                                                                                                                                                                                                                    | -                                                                                                                         |
| 2 cm Muck (Å10)       Depleted Matrix (F3)       Other (explain in remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F6)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         Sandy Mucky Mineral (S1)       Redox Depressions (F8)       "Indicators of hydrophytic vegetation and weltan hydrology must be present, unless disturbed or problematic         strictive Layer (if observed):       +       +       +         pet (inches):       -       +       +         amarks:       -       +       +       +         The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.       Secondary Indicators (minimum of two requiparts)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Scill Cracks (B6)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Scill Cracks (B6)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B3)       -       Presence of Reduced iron (C4)       Stunted or Stressed Plants (D1)         Mark Marks (B1)       Oxidized Rhizospheres on Living Roots       Grayfish Burrows (C8)       Gauga or Well Data (D9)         Drift Deposits (B                                                                                                                                                                                                         | ·                                                                                                                                                                                                                                                        | - ,                                                                                                                                                                                                                                                                                                                | •                                                         |                       | _                                                       | -                                                                                                                 |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Depleted Below Dark Surface (A11)       Redox Dark Surface (F6)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)         Sandy Mucky Mineral (S1)       Redox Depressions (F8)         \$ orm Mucky Peat or Peat (S3)       problematic         perticipation       problematic         perticipation       Problematic         perticipation       Problematic         problematic       Problematic         problem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           | _                     |                                                         |                                                                                                                   |                                                                                                                                                                  | • •                                                                                                             |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      | N= 1 4                                                                                                                    |
| Sandy Mucky Mineral (S1)       Redox Depressions (F8)       Indicators or injurce vegetation and weitant hydrology must be present, unless disturbed or problematic         strictive Layer (if observed):       Present       Hydric soil present?       Y         pet:       Hydric soil present?       Y         emarks:       Hydric soil present?       Y         marks:       Hydric soil present?       Y         entarks:       Hydric soil present?       Y         getation Hydrology Indicators:       Secondary Indicators (minimum of two required: check all that apply)       Secondary Indicators (minimum of two required: check all that apply)         Surface Water (A1)       Aquatic Plants (B14)       Drainage Patterns (B10)         Saturation (A3)       Hydrology Suffee Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C6)         Sediment Deposits (B2)       (C3)       Saturation Nisble on Aerial Imagery (C9)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (64)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    | Surface                                                   | ∍(A11) —              |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         | • •                                                                                    |                                                                                                                                                                                                                      |                                                                                                                           |
| Sandy Mucky Mineral (S1)       Redox Depressions (F8)       hydrology must be present, unless disturbed or problematic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Thi                                                                                                                                                                                                                                                      | ck Dark Surface (                                                                                                                                                                                                                                                                                                  | A12)                                                      | · · -                 | De                                                      | pleted Da                                                                                                         | ark Surfa                                                                                                                                                        | œ (F7)                                                                                                          | *India                                                                                                                  | tors of bud                                                                            |                                                                                                                                                                                                                      | antolion and wolfon                                                                                                       |
| 5 cm Mucky Peat or Peat (S3)       problematic         setrictive Layer (if observed):       P         pe:       Hydric soil present?       Y         pht (inches):       P         emarks:       P         The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY         etland Hydrology Indicators:         imary Indicators (minimum of one is required: check all that apply)       Secondary Indicators (minimum of two required):         Surface Water (A1)       Aquatic Fianta (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation in Tilled Soils       Geomorphic Position (D2)         Init Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)                                                                                                                                                                                                                                                                    | Sar                                                                                                                                                                                                                                                      | ndy Mucky Minera                                                                                                                                                                                                                                                                                                   | l (S1)                                                    |                       | Re                                                      | dox Depi                                                                                                          | ressions (                                                                                                                                                       | (F8)                                                                                                            |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| pe:       Hydric soil present?       Y         pth (inches):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5 ci                                                                                                                                                                                                                                                     | n Mucky Peat or I                                                                                                                                                                                                                                                                                                  | Peat (S3                                                  | )                     |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        | -                                                                                                                                                                                                                    |                                                                                                                           |
| ppth (inches):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                                                           |                       |                                                         | <u> </u>                                                                                                          |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Imarks:         The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY         ettand Hydrology Indicators:         imary Indicators (minimum of one is required: check all that apply)       Secondary Indicators (minimum of two required)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       True Aquatic Plants (B14)       Drainage Pattems (B10)         Saturation (A3)       Hydrogen Sulfde Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5).         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)         Water-Stained Leaves (B9)       Other (Explain in Remarks)       Wetland ariter table present?       Yes         water atioe present?       Yes       No       X       Depth (inches):       Mydrology                                                                                                                                                                                                                               | estrictive                                                                                                                                                                                                                                               | Layer (if observe                                                                                                                                                                                                                                                                                                  | ed):                                                      |                       |                                                         |                                                                                                                   |                                                                                                                                                                  |                                                                                                                 |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| The subject property consists of potentially contaminated soils and were not sampled. Soils are assumed to be hydric.         YDROLOGY         ettand Hydrology Indicators:         Imary Indicators (minimum of one is required: check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)         High Water Table (A2)       True Aquatic Plants (B14)         Saturation (A3)       Hydrogen Sulfde Odor (C1)         Saturation (A3)       Presence of Reduced Iron (C4)         Stanted or Stressed Plants (D1)       Agail Mat or Crust (B4)         Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauga or Well Data (D9)         Water-Stained Leaves (B9) <t< th=""><th>/ре:</th><th></th><th>ed):</th><th></th><th></th><th></th><th>-</th><th></th><th>Hydric</th><th>soil prese</th><th>nt? <u> </u></th><th></th></t<>                                                                                                                                        | /ре:                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                    | ed):                                                      |                       |                                                         |                                                                                                                   | -                                                                                                                                                                |                                                                                                                 | Hydric                                                                                                                  | soil prese                                                                             | nt? <u> </u>                                                                                                                                                                                                         |                                                                                                                           |
| etiand Hydrology Indicators:         Imary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Yes       No         water table present?       Yes       No         No       X       Depth (inches):       Wetland         hydrology       present?       No       X                                                                                                                                                                                                                                                                                                                                                                       | /pe:<br>epth (inche<br>emarks:                                                                                                                                                                                                                           | es):                                                                                                                                                                                                                                                                                                               |                                                           | of notenti            | alivo                                                   | optamir                                                                                                           | -<br>                                                                                                                                                            | pils and y                                                                                                      |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      |                                                                                                                           |
| Imary Indicators (minimum of one is required; check all that apply)       Secondary Indicators (minimum of two required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       True Aquatic Plants (B14)       Drainage Pattems (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)         Gauge or Well Data (D9)       Other (Explain in Remarks)       Wetland         eld Observations:       Yes       No       X       Depth (Inches):       Wetland         atter table present?       Yes       No       X       Depth (Inches):       No       No         Autorion present?       Yes       No       X       Depth (Inches):       Present?       No                                                                                                                                                                                                                                                                                                                                           | rpe:<br>epth (incho<br>emarks:<br>The sub<br>hydric.                                                                                                                                                                                                     | es):                                                                                                                                                                                                                                                                                                               |                                                           | of potenti            | ally c                                                  | ontamir                                                                                                           | nated sc                                                                                                                                                         | bils and v                                                                                                      |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      | assumed to be                                                                                                             |
| Surface Water (A1)       Aquatic Fauna (B13)       Surface Soil Cracks (B6)         High Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation Visible on Aerial Imagery (C9         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)         Water-Stained Leaves (B9)       Other (Explain in Remarks)       Wetland         eld Observations:       Yes       No       X       Depth (inches):       Wetland         ater table present?       Yes       No       X       Depth (inches):       Nydrology         ater table present?       Yes       No       X       Depth (inches):       present?       N                                                                                                                                                                                                                                                                                                                                                                                                        | rpe:<br>epth (incho<br>emarks:<br>The sub<br>hydric.<br>YDROLO                                                                                                                                                                                           | es):<br>ject property co<br>DGY                                                                                                                                                                                                                                                                                    | onsists                                                   | of potenti            | ally c                                                  | ontamir                                                                                                           | nated sc                                                                                                                                                         | bils and v                                                                                                      |                                                                                                                         |                                                                                        |                                                                                                                                                                                                                      | assumed to be                                                                                                             |
| High Water Table (A2)       True Aquatic Plants (B14)       Drainage Patterns (B10)         Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Yes       No         water table present?       Yes       No         No       X       Depth (inches):       Wetland hydrology present?         Autorion present?       Yes       No       X       Depth (inches):       No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | rpe:<br>epth (incho<br>emarks:<br>The sub<br>hydric.<br>YDROLO<br>etland Hy                                                                                                                                                                              | es):<br>ect property co<br>DGY<br>drology Indicato                                                                                                                                                                                                                                                                 | onsists                                                   |                       |                                                         |                                                                                                                   |                                                                                                                                                                  | bils and v                                                                                                      | were not sa                                                                                                             | mpled.                                                                                 | Soils are a                                                                                                                                                                                                          | · · · · · · · · · · · · · · · · · · ·                                                                                     |
| Saturation (A3)       Hydrogen Sulfide Odor (C1)       Dry-Season Water Table (C2)         Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Yes       No         urface water present?       Yes       No         No       X       Depth (inches):       Wetland         hydrology       present?       No       X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | pe:<br>epth (incho<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>etland Hy<br>imary Indi                                                                                                                                                                 | es):<br>ject property co<br>DGY<br>drology Indicato<br>icators (minimum                                                                                                                                                                                                                                            | onsists                                                   |                       |                                                         | all that a                                                                                                        |                                                                                                                                                                  |                                                                                                                 | were not sa                                                                                                             | ampled.                                                                                | Soils are a                                                                                                                                                                                                          | ninimum of two requ                                                                                                       |
| Water Marks (B1)       Oxidized Rhizospheres on Living Roots       Crayfish Burrows (C8)         Sediment Deposits (B2)       (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Yes       No         ater table present?       Yes       No         No       X       Depth (inches):       Mydrology         ater table present?       Yes       No       X       Depth (inches):       No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | pe:<br>ppth (incho<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>etland Hy<br>imary Indi<br>Surface                                                                                                                                                      | es):<br>ject property co<br>OGY<br>drology Indicato<br>icators (minimum<br>Water (A1)                                                                                                                                                                                                                              | onsists                                                   |                       |                                                         | all that a                                                                                                        | a <u>opiy)</u><br>Fauna (B                                                                                                                                       | 13)                                                                                                             | were not sa                                                                                                             | econdary In                                                                            | Soils are a<br>dicators (m<br>Soil Cracks                                                                                                                                                                            | ninimum of two requ<br>s (B6)                                                                                             |
| Sediment Deposits (B2)       (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5).         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       Sparsely Vegetated Concave Surface (B8)         Water-Stained Leaves (B9)       Other (Explain in Remarks)       Other (Explain in Remarks)         eld Observations:       Yes       No       X       Depth (Inches):       Wetland         aturation present?       Yes       No       X       Depth (Inches):       No       No         aturation present?       Yes       No       X       Depth (Inches):       No       No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | pe:<br>epth (inche<br>emarks:<br>The sub<br>hydric.<br>YDROL<br>etland Hy<br>imary Indi<br>Surface<br>High Wa                                                                                                                                            | es):<br>ject property co<br>OGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)                                                                                                                                                                                                           | onsists                                                   |                       |                                                         | <u>all that a</u><br>Aquatic<br>True Ac                                                                           | a <u>pply)</u><br>Fauna (B<br>quatic Plar                                                                                                                        | 113)<br>nts (B14)                                                                                               | were not sa<br><u>Se</u>                                                                                                | econdary In<br>Surface                                                                 | Soils are a<br>dicators (m<br>Soil Cracks<br>ge Patterns (                                                                                                                                                           | <u>hinimum of two requ</u><br>s (B6)<br>(B10)                                                                             |
| Drift Deposits (B3)       Presence of Reduced Iron (C4)       Stunted or Stressed Plants (D1)         Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5).         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)       FAC-Neutral Test (D5).         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)       Other (Explain in Remarks)         eld Observations:       Yes       No       X       Depth (Inches):       Wetland         aturation present?       Yes       No       X       Depth (Inches):       Nydrology         aturation present?       Yes       No       X       Depth (Inches):       Nydrology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | pe:<br>epth (inche<br>emarks:<br>The sub<br>hydric.<br>YDROLO<br>etland Hy<br>imary Indi<br>Surface<br>High Wa<br>Saturati                                                                                                                               | es):<br>ject property co<br>DGY<br>drology indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)                                                                                                                                                                                                | onsists                                                   |                       |                                                         | all that a<br>_ Aquatic<br>_ True Ac<br>_ Hydroga                                                                 | apply)<br>Fauna (B<br>quatic Plar<br>en Sulfide                                                                                                                  | 13)<br>nts (B14)<br>odor (C1                                                                                    | were not sa<br><u>Sa</u><br>-<br>-                                                                                      | econdary In<br>Surface<br>Drainag                                                      | Soils are a<br>dicators (m<br>Soil Cracks<br>ge Pattems (<br>ason Water                                                                                                                                              | <u>ninimum of two requ</u><br>s (B6)<br>(B10)<br>Table (C2)                                                               |
| Algal Mat or Crust (B4)       Recent Iron Reduction in Tilled Soils       Geomorphic Position (D2)         Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5)         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Yes         urface water present?       Yes         No       X       Depth (Inches):         aturation present?       Yes         No       X       Depth (Inches):         aturation present?       Yes         No       X       Depth (Inches):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | pe:<br>epth (inche<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>etland Hy<br>imary Indi<br>Surface<br>High Wa<br>Saturati<br>Water M                                                                                                                    | es):<br>ject property co<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)                                                                                                                                                                                  | onsists                                                   |                       |                                                         | all that a<br>Aquatic<br>True Ac<br>Hydroga<br>Oxidize                                                            | apply)<br>Fauna (B<br>quatic Plar<br>en Sulfide                                                                                                                  | 13)<br>nts (B14)<br>odor (C1                                                                                    | were not sa<br><u>Sa</u><br>-<br>-                                                                                      | econdary In<br>Surface<br>Drainag<br>Crayfisl                                          | Soils are a<br>dicators (m<br>Soil Cracks<br>Je Patterns (<br>ason Water<br>h Burrows ((                                                                                                                             | ninimum of two requ<br>s (B6)<br>(B10)<br>Table (C2)<br>C8)                                                               |
| Iron Deposits (B5)       (C6)       FAC-Neutral Test (D5).         Inundation Visible on Aerial Imagery (B7)       Thin Muck Surface (C7)         Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | pe:<br>epth (inche<br>emarks:<br>The sub<br>hydric.<br>YDROL(<br>etland Hy<br>imary Indi<br>Surface<br>High Wa<br>Saturatio<br>Water M<br>Sedimen                                                                                                        | es):<br>ject property co<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)                                                                                                                                                              | onsists                                                   |                       |                                                         | all that a<br>Aquatic<br>True Ac<br>Hydroga<br>Oxidize<br>(C3)                                                    | apply)<br>Fauna (B<br>quatic Plar<br>en Sulfide<br>d Rhizosp                                                                                                     | 13)<br>nts (B14)<br>Odor (C1<br>pheres on I                                                                     | were not sa<br><u>Se</u><br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | econdary In<br>Surface<br>Drainag<br>Dry-Sea<br>Crayfisl<br>Saturat                    | Soils are a<br>dicators (m<br>Soil Cracks<br>ge Patterns (<br>ason Water<br>h Burrows (<br>Ion Visible c                                                                                                             | ninimum of two requ<br>s (B6)<br>(B10)<br>Table (C2)<br>C8)<br>on Aerial Imagery (C9                                      |
| Sparsely Vegetated Concave Surface (B8)       Gauge or Well Data (D9)         Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       Inface water present?         urface water present?       Yes         No       X       Depth (inches):         aturation present?       Yes         No       X       Depth (inches):         aturation present?       Yes         No       X       Depth (inches):         present?       Yes         No       X       Depth (inches):         present?       Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | pe:<br>epth (inche<br>emarks:<br>The sub<br>hydric.<br>YDROLO<br>etland Hy<br>imary Indi<br>Surface<br>High Wa<br>Saturatie<br>Water M<br>Sedimen<br>Drift De                                                                                            | es):<br>ject property co<br>OGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)                                                                                                                                               | onsists                                                   |                       |                                                         | all that a<br>Aquatic<br>True Ac<br>Hydroga<br>Oxidize<br>(C3)<br>Presend                                         | apply)<br>Fauna (B<br>quatic Plar<br>en Sulfide<br>d Rhizosp<br>ce of Redu                                                                                       | 113)<br>Ints (B14)<br>Odor (C1<br>Interes on I<br>Uced Iron (                                                   | were not sa                                                                                                             | econdary In<br>Surface<br>Drainag<br>Dry-Sei<br>Crayfist<br>Saturat<br>Sturted         | Soils are a<br>dicators (m<br>Soil Cracks<br>ge Patterns (<br>ason Water<br>h Burrows (<br>lon Visible c<br>l or Stressed                                                                                            | ninimum of two requ<br>s (B6)<br>(B10)<br>Table (C2)<br>C8)<br>on Aerial Imagery (C9<br>d Plants (D1)                     |
| Water-Stained Leaves (B9)       Other (Explain in Remarks)         eld Observations:       unface water present?       Yes       No       X       Depth (Inches):       Wetland         ater table present?       Yes       No       X       Depth (Inches):       hydrology         aturation present?       Yes       No       X       Depth (Inches):       present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | pe:<br>epth (inche<br>emarks:<br>The sub<br>hydric.<br>YDROLO<br>etland Hy<br>imary Indi<br>Surface<br>High Wa<br>Saturati<br>Water M<br>Sedimen<br>Drift Den<br>Algal Ma                                                                                | es):<br>ject property co<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)                                                                                                                           | onsists                                                   |                       |                                                         | ail that a<br>Aquatic<br>True Ac<br>Hydroga<br>Oxidize<br>(C3)<br>Presend<br>Recent                               | apply)<br>Fauna (B<br>quatic Plar<br>en Sulfide<br>d Rhizosp<br>ce of Redu                                                                                       | 113)<br>Ints (B14)<br>Odor (C1<br>Interes on I<br>Uced Iron (                                                   | were not sa                                                                                                             | econdary In<br>Surface<br>Drainag<br>Dry-Sei<br>Crayfis<br>Saturat<br>Sturtec<br>Geomo | Soils are a<br>dicators (m<br>Soil Cracks<br>ge Pattems (<br>ason Water<br>h Burrows (<br>lon Visible c<br>lon Visible c<br>rphic Positio                                                                            | ninimum of two requ<br>s (B6)<br>(B10)<br>Table (C2)<br>C8)<br>on Aerial Imagery (C9<br>d Plants (D1)<br>on (D2)          |
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| escribe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ype:<br>epth (inche<br>emarks:<br>The sub,<br>hydric.<br>YDROLO<br>(etland Hy<br>rimary Indi<br>Surface<br>High Wa<br>Saturation<br>Vater M<br>Sedimen<br>Drift De<br>Algal Ma<br>Iron Der<br>Inundati<br>Sparsel<br>Water-S<br>field Obse<br>urface wal | es):<br>ject property co<br>DGY<br>drology Indicato<br>icators (minimum<br>Water (A1)<br>ater Table (A2)<br>on (A3)<br>farks (B1)<br>nt Deposits (B2)<br>posits (B3)<br>at or Crust (B4)<br>posits (B5)<br>on Visible on Aeria<br>y Vegetated Conca<br>Stained Leaves (B9<br>rvations:<br>ler present?<br>present? | I Imagen<br>ve Surfa<br>)<br>Yes<br>Yes                   | s required;<br>s (B7) | <u>check</u>                                            | all that a<br>Aquatic<br>True Ac<br>Hydroga<br>(C3)<br>Presend<br>(C6)<br>Thin Mu<br>Gauge<br>Other (I            | apply)<br>Fauna (B<br>uatic Plar<br>en Sulfide<br>d Rhizosp<br>ce of Redu<br>Iron Redu<br>Iron Redu<br>Iron Redu<br>Iron Redu<br>Iron Redu<br>Depth (<br>Depth ( | 13)<br>oldor (C1)<br>oheres on l<br>uced iron (<br>uction in Ti<br>ce (C7)<br>ata (D9)<br>Remarks)<br>(inches): | were not sa<br>Si<br>Living Roots<br>(C4)                                                                               | econdary Im<br>Surface<br>Drainag<br>Dry-Sei<br>Saturat<br>Stunted<br>Geomo<br>FAC-No  | Soils are a<br>dicators (m<br>e Soil Cracks<br>ge Patterns (<br>ason Water<br>h Burrows ((<br>lon Visible c<br>lon Visible c<br>lon Visible c<br>lon Stressed<br>rphic Positio<br>eutral Test (<br>etland<br>drology | ninimum of two requ<br>s (B6)<br>(B10)<br>Table (C2)<br>C8)<br>on Aerial Imagery (C9<br>d Plants (D1)<br>on (D2)<br>D5)   |

**Midwest Region** 

Hey and Associates, Inc.





#### STORMWATER MANAGEMENT COMMISSION

June 11, 2012

Mr. Naren M. Prasad Integrys Business Support 130 East Randolph Street, 22nd Floor Chicago, 11, 60601

RE: WDP No. 02-47-214A; Preliminary Jurisdictional Determination/Boundary Verification Property at SEC Dahringer and Pershing Roads; Waukegan, Illinois PIN 08-15-300-030; Lat: 42.37392 Lon: -87.82446

#### Dear Mr. Prasad:

This letter responds to your application submitted on your behalf by Natural Resource Technology, Inc., and received by the Lake County Stormwater Management Commission (SMC) on May 24, 2012 requesting a preliminary wetland jurisdictional determination (PJD) and boundary verification for the property referenced above. SMC reviewed source materials in the company of Mr. Mike Murphy of the U.S. Army Corps of Engineers (USACE) on June 7, 2012. Please note that wetland numbers are as depicted on Exhibit 7 (attached).

Wetlands 1, 2, and 3 are "Isolated Waters of Lake County" (IWLC) as defined in the Lake County Watershed Development Ordinance (WDO). SMC concurs with the wetland boundaries as flagged in the field. See below for permitting requirements.

Lake_County's Watershed Development Ordinance Requirements:

This letter satisfies the WDO requirement for a written jurisdictional determination under Article IV, Section E.2.a. Your proposed work appears to be within the City of Waukegan. The WDO requires a Watershed Development Permit (WDP) issued by Waukegan for any proposed development. You should contact Mr. Ron Laubach at 847/625-6827 for the appropriate permit application form and procedures with respect to the WDO's requirements. Please contact me (SMC) for approval of the project with respect to the WDO isolated wetland provisions.

SMC determined the jurisdiction of potential WOUS areas on the subject property based upon the guidance provided in the EPA/USACE Memorandum entitled "Clean Water Act Jurisdiction Following the U.S. Supreme Court's decision in <u>Rapanos v. United States</u> & <u>Carabell v. United</u> <u>States</u>" dated June 5, 2007 (revised December 2, 2008) and the USACE's *Jurisdictional Determination Form Instructional Guidebook* dated May 30, 2007. For areas not considered to be WOUS, we determined jurisdiction using the definition of *Isolated Waters of Lake County* contained in Appendix A of the WDO.

500 W. Winchester Road • Libertyville, Illinois 60048 • 847/377-7700 • FAX 847/984-5747

Mr. Prasad WDP NO. 02-47-214A June 11, 2012 Page 2 of 2

SMC's Chief Engineer approved this PJD and the findings are valid for a period of three (3) years from the date of this letter, unless new information warrants a revision before the expiration date. We would like to be of assistance. If you have any questions, or would like to set up a meeting, please call our office at (847) 377-7705 or e-mail me at <u>jhmieleski@lakecountyil.gov</u>. If you have any additional concerns that have not been addressed by the regulatory staff, you may contact Chief Engineer Kurt Woolford <u>kwoolford@lakecountyil.gov</u> or Executive Director Michael Warner <u>mwarner@lakecountyil.gov</u> at (847) 377-7700.

Sincerely,

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION

Vorysh I. Handleti

Joseph I. Hmieleski, P.W.S., CFM Principal Wetland Specialist

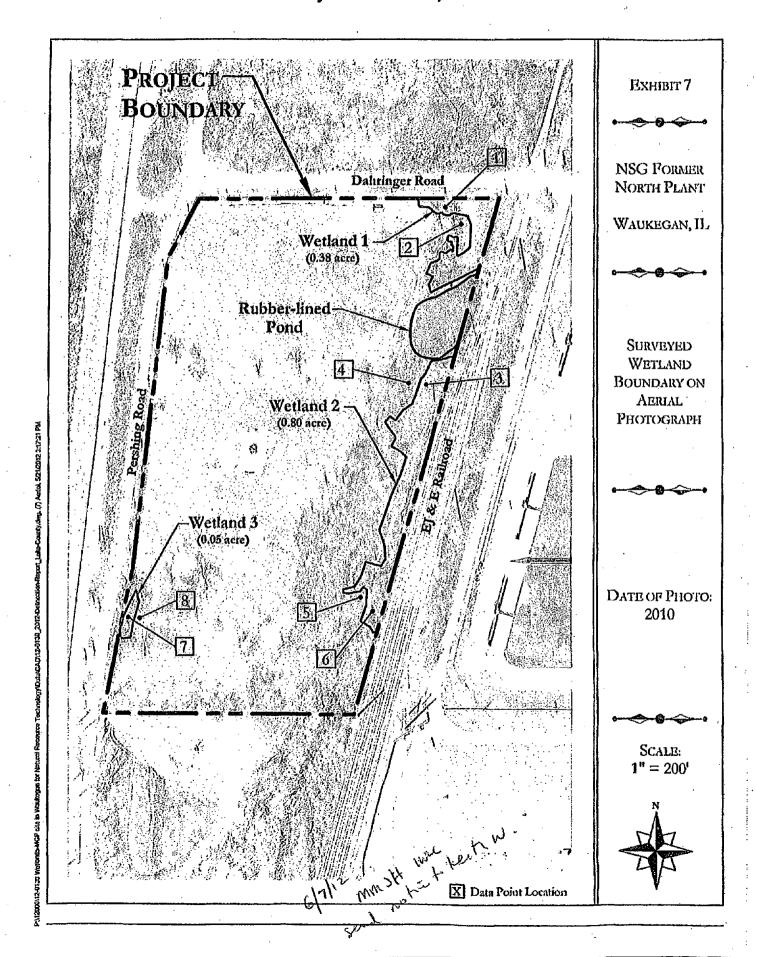
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Kurt Woolford, PE, CFM Chief Engineer

c: Mr. Mike Murphy – USACE Mr. Ron Laubach – City of Waukegan Mr. Scott Kuykendall – Hey and Associates Mr. Glenn Luke - NRT

We transmitted this document via email. Please print out a copy of the document and retain for your records. If you are unable to print the document, or desire a hard copy mailed to you, please notify SMC at your earliest convenience.

Hey and Associates, Inc.



## Hey and Associates, Inc.

Water Resources, Wellands and Ecology

BROOKFIELD, WISCONSIN

26575 W. Commerce Drive, Suite 601 Volo, Illinois 60073 Рнолб (847) 740-0888 Fax (847) 740-2888

CHICAGO AND AURORA, ILLINOIS

July 12, 2012

Mr. Glenn Westman Lake County Stormwater Management Commission 500 W. Winchester Road Libertyville, IL 60048

Project No.: 12-0130

Re: WDP No. 02-47-214A North Shore Gas Company North Plant Site Waukegan, Illinois

#### Dear Glenn:

In anticipation of our upcoming pre-application meeting, we wanted to provide you with some specific background information about the site history of the referenced property. A great deal of industrial activities have taken place on the site and these are relevant to the existing conditions that occur on the site today. We are providing this information to initiate the discussion regarding the on-site wetland areas being exempted from the provisions of the Watershed Development Ordinance (WDO) due to the previous earthwork and other activities that have taken place on the site.

On-site industrial activities began in the early 1900's as a manufactured gas plant with railroad access. The facility was active in various permutations until the 1970's when gas production ceased. Over time buildings and associated structures were fazed and the site was filled and graded. Little activity has taken place on the site over the last several decades other than some remediation of coal tar deposits in the mid 1990's and the construction of the rubber-lined poind that currently exists on the site.

The following is a list of attached exhibits that we have extracted from the large amount of previously collected data about the site's history and contaminated soils.

Exhibit 1 – Site Location Map

Exhibit 2 – 1939 Aerial Photograph

Exhibit 3 – 1964 Aerial Photograph

Exhibit 4 – 1990 Aerial Photograph

Exhibit 5 - Soil Boring/Probe Location Index Map

Exhibit 6 - Representative Soil Borings for Wetland Areas

Exhibit 7 - Geologic Cross-Section Location Map

Exhibit 8 - Geologic Cross Sections

Exhibit 9 - Lake County Soil Survey

Mr. Glenn Westman North Shore Gas – North Plant Site History July 12, 2012 Page 2

The aerial photographs clearly show that the site has undergone many changes through the decades. We understand that the water feature shown on the 1964 aerial photograph (Exhibit 3) was excavated as a borrow area and then later used for depositing waste materials. The 1990 aerial (Exhibit 4) clearly shows that the feature has been filled in. The fact is further documented in both the soil borings (Exhibit 6) and the geologic cross sections (Exhibit 8) that the entire site has a continuous layer of fill materials of varying materials from Dahringer Road to the railroad tracks. The Lake County Soil Survey (Exhibit 9) is of limited value since the map was prepared after the majority of the site was modified and is entirely labeled "Made Land". There are both upland and wetland soils adjacent to the site but it would be difficult to reconstruct a legitimate pre-disturbance soil map for the site.

It is unclear whether wetlands occurred on the site prior to any industrial activities. The near-lake environs of the Waukegan area even to this day is a complex mix of upland and wetland areas due to the dune and swale features prevalent in that part of the county. However, we believe that the data provided clearly indicates that the existing wetland formed on non-native "soil" materials, including brown sand, topsoil, gypsum and coal tar. Shallow groundwater, which is likely partially trapped by the railroad embankment, expresses itself at or near the surface for a long of period of time to help develop wetland conditions.

In conclusion, we believe that a reasoned argument can be made that the site wetlands should be exempted from the wetland provisions of the Watershed Development Ordinance since the wetlands have formed on top of fill materials. Article IV, Section A.2 indicates that certain development can be exempted from the performance standards of the Ordinance if certain conditions are met. The subject property was developed and abandoned decades before October 18, 1992 and well before any regulatory permits were necessary for such activities. Therefore, it can be reasonably assumed that the site land use was "permitted by right" as was customary for similar sites in the early to mid 1900's. Also, using the definitions in the WDO, the site wetlands could meet either the criteria for an excavation/impoundment or as an area created by incidental grading. Either way, the areas could legitimately be exempted from regulation under the WDO.

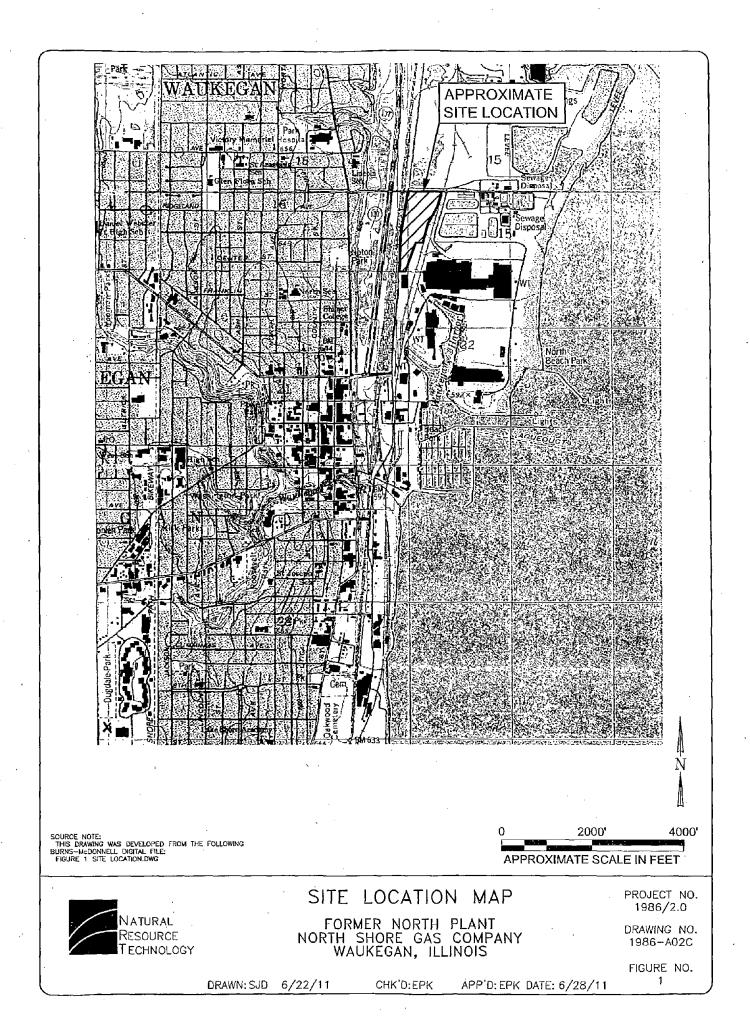
We will bring additional background materials with us to the pre-application meeting. We look forward to discussing the site and its unique circumstances at that time.

Sincercly

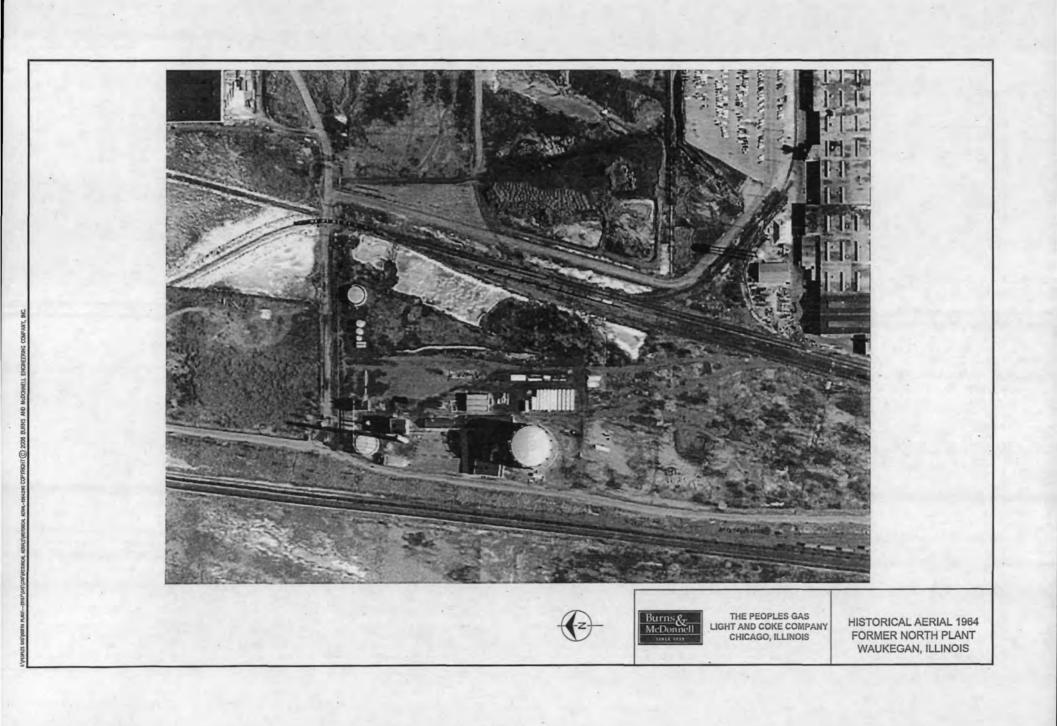
Vincent J. Mosca, CWS #023 Senior Ecologist, Vice President

cc: Glenn Luke, NRT Naren M. Prasad, Integrys Business Support, LLC Mike Jouras, Integrys Business Support, LLC

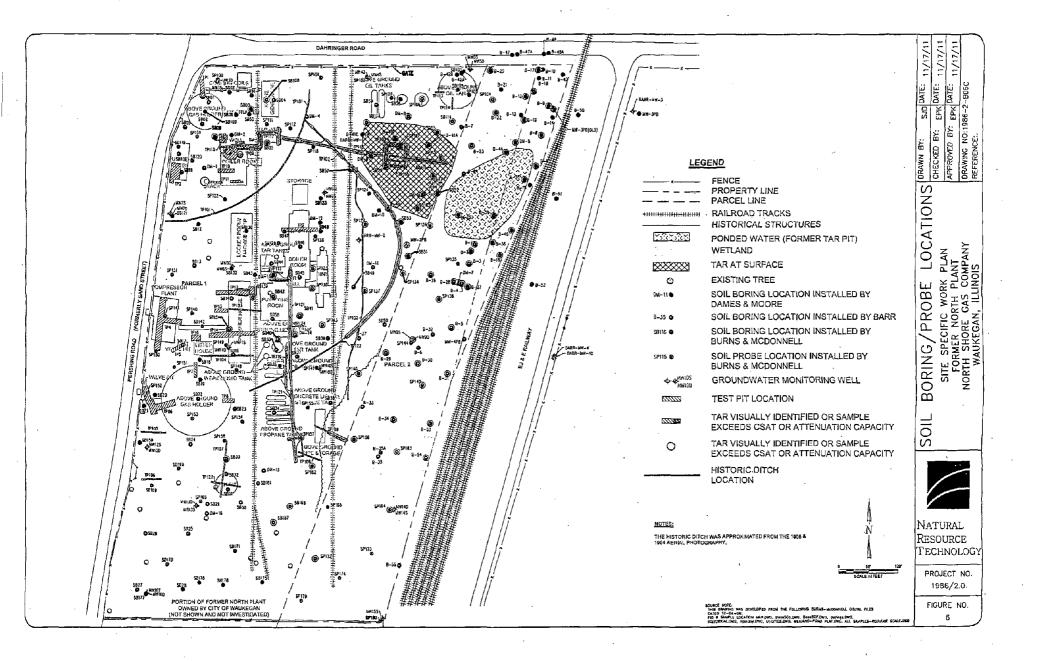
Enclosures











# **BORING LOG**

PROJECT: Waukegan Tar Pit Site DATE STARTED: 3-26-91 DATE COMPLETED: 3-26-91 FIELD INSPECTOR: Bay Wuolo (BEC) CREW CHIEF: Exploration Technology BORING NO .: B-17

RISER PIPE ELEVATION: N/A

GROUND SURFACE ELEVATION: _585.8

|          | Depth<br>(Feet) | Blows<br>Per 5"     | Sample<br>Type | Percent<br>Recovery |                    | Net<br>HNU | Profile | DESCRIPTION OF MATERIALS AND REMARKS                                                                                                                          |
|----------|-----------------|---------------------|----------------|---------------------|--------------------|------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                 |                     | cs             | 50%                 | dry<br>to<br>moist | 0ppm       |         | 0.0-0.2 Brown sandy topsoil<br>0.2-1.4 Dark brown sandy silt<br>1.4-1.7 Tan sand slightly cohesive<br>Continuous sampling abandoned due to poor recovery.     |
| 5        | -               | 2<br>1<br>1<br>1    | ss y           | 50%                 | wet                | NA         |         | Brown sand, no tar                                                                                                                                            |
|          |                 | 2<br>1<br>1<br>1    | SS             | 5%                  | wet                | NA         |         | Sand with black tar in pores, oil sheen, strong tar odor (slight solvent odor)                                                                                |
|          |                 | 1<br>0<br>0<br>0    | SS             | 0%                  | - wet              | NA         |         | No recovery -cuttings-have dark oily sheen-sand<br>odor is that of gasoline or a solvent                                                                      |
| 10       | , –             | 0<br>50-NA          | SS             | NA                  | - wet              | NA         |         | Same as above, bottom inch is very strongly cemented sandy gravel- the gravel is very angular white to buff material (sample), no visible sheen or coloration |
|          |                 | 11<br>14<br>8<br>21 | SS             | NA                  | —<br>— wət         | NA         | 2.74    | Fine to medium, gray to brown silty sand some tarry sand (very minor tar at 12.0)-<br>maybe in groundwater. Minor tar odor (slight solvent odor).             |
| 20<br>25 |                 |                     |                |                     |                    |            |         | Augering stopped at 11.5'- auger going crooked                                                                                                                |
| 30       | -               |                     |                |                     |                    | -          | •       |                                                                                                                                                               |

COMMENT: Ground Surface Elevation Referenced to North East Manhole (Assigned Elevation of 100 Ft.). Later converted to Feet MSL (100 Ft. = 586.4 Ft. MSL). CS: Continuous Sample SS: Split Spoon Sample

SHEET _____ OF____

2³²¹

# **BORING LOG**

PROJECT: Waukegan Tar Pit Site DATE STARTED: 3-29-91 DATE COMPLETED: 3-29-91 FIELD INSPECTOR: James Staberg(BEC) CREW CHIEF: Exploration Technology

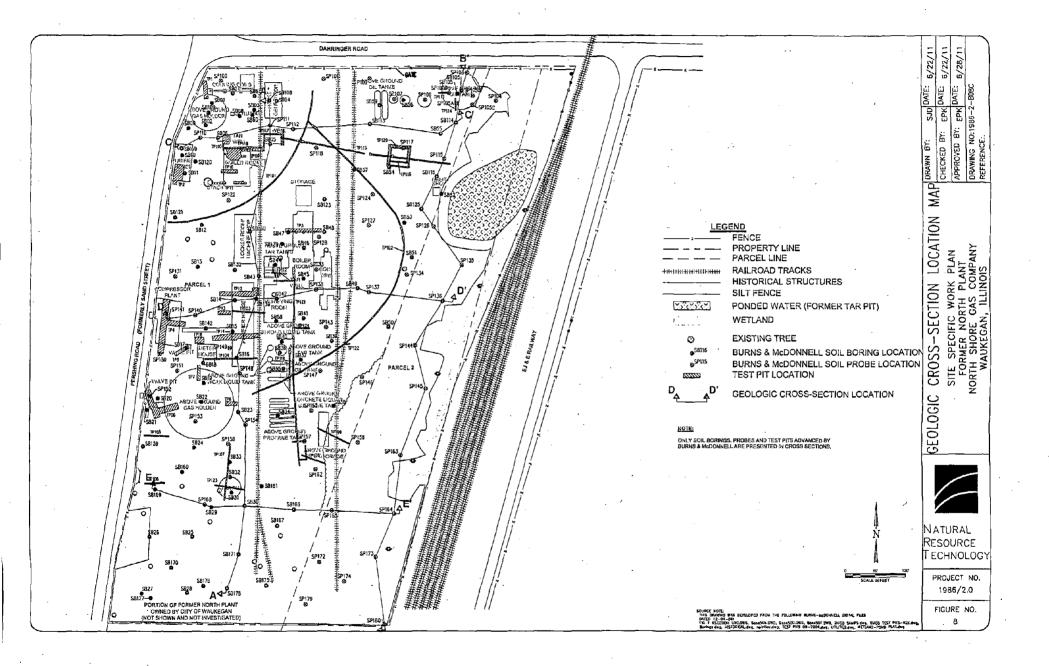
BORING NO .: B-31

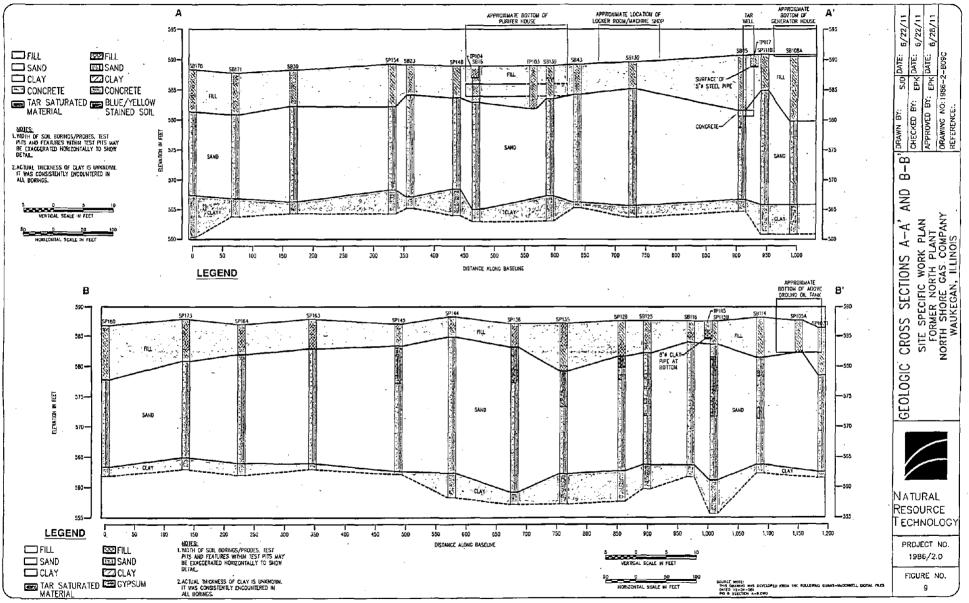
RISER PIPE ELEVATION: N/A

**GROUND SURFACE ELEVATION: 586.1** 

| 0<br>- 0<br>- 1 SS 50% - dry 1ppm Size Broken gypsum board material with a trace of tar<br>- 4<br>- 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 4 SS 20% wet 5ppm 次派法 Gypsum board material with some tar (sample)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| 3         4         SS         50%         40 ppr         4.4 Tar           5         5         50%         wet         5pm         5.0-5.4 Tar with sand (sample)           5         5         6         6         6         6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| 3     SS     90%     wet     35ppm     Black sand-tar (sample) (picture-8) tar at 7.0       2     4     -     -     -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| $\begin{bmatrix} 5 \\ 4 \\ 9 \\ 10 \end{bmatrix}$ SS 100% wet 30ppm Black sand with traces of tar at 9.0'<br>Black sand with traces of tar at 9.0'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| 6         SS         100%         - wet         25ppm         Same as above, no traces of tar           11         15         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - </td <td></td> |  |
| 1         SS         100%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| 5         SS         100%         wet         Same as above (picture-9)           15         9         8          20ppm           20ppm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| E.O.B. 16'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
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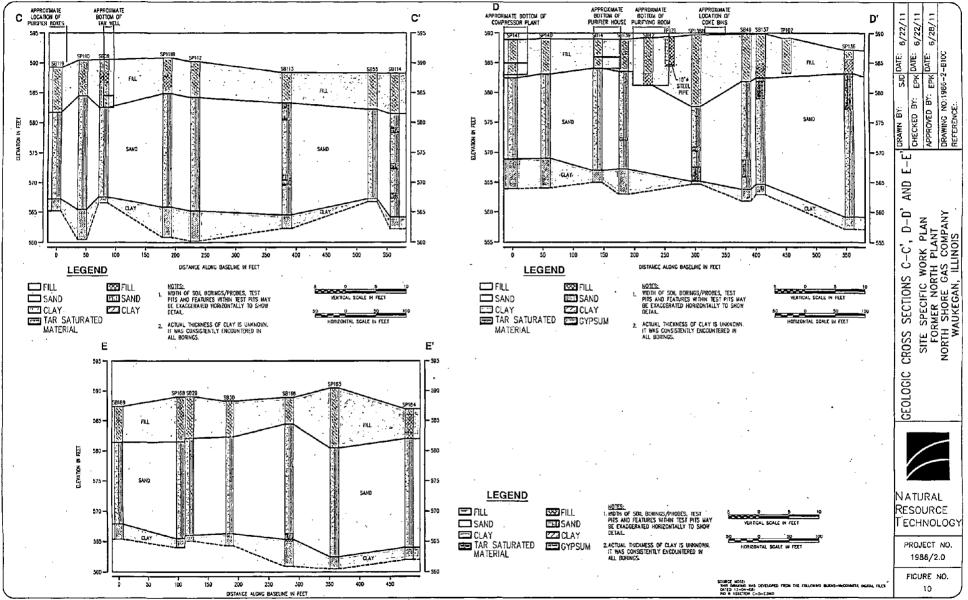
Later converted to Feet MSL (100 Ft = 586.4 Ft. MSL). CS: Continuous Sample SS: Split Spoon Sample





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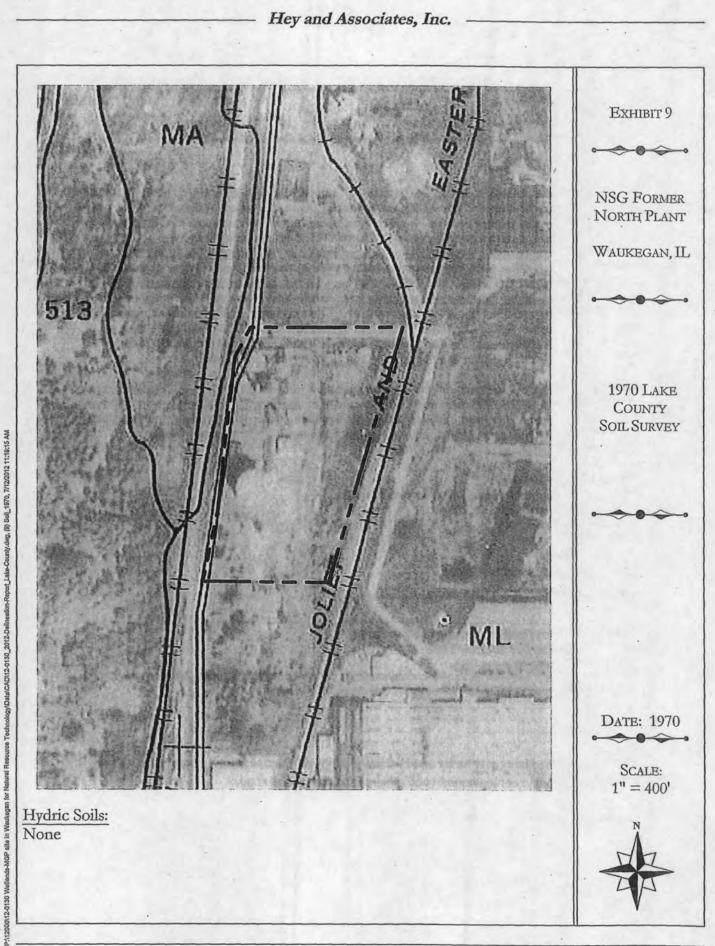


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| From:    | Westman, Glenn H.                                                                                    |
|----------|------------------------------------------------------------------------------------------------------|
| To:      | <u>"vmosca@heyassoc.com"</u>                                                                         |
| Cc:      | Glenn R. Luke; Jennifer M. Kahler; nmprasad@integrysgroup.com; mpjouras@integrysgroup.com; Woolford. |
|          | Kurt A.                                                                                              |
| Subject: | RE: NSG Property at SEC Pershing & Dahringer, Waukegan                                               |
| Date:    | Tuesday, July 17, 2012 2:43:18 PM                                                                    |
|          |                                                                                                      |

#### 7-17-12; SMC Permit File #02-47-214A

Following up on our pre-application meeting yesterday, I had the opportunity today to confer with Kurt Woolford, SMC's chief engineer, concerning the regulatory status of isolated Wetlands 1-3 on the NSG property (see attached wetland exhibit). Based on our review of the various maps, historic air photos and other supporting documentation provided by Hey & NRT, it appears that <u>Wetlands 1 and 2 meet</u> exclusion criterion a.(2) under the definition of *Isolated Waters of Lake County* (IWLC) in WDO Appendix A. Therefore, SMC will issue a letter shortly formally excluding these 2 IWLC from regulatory status under the WDO. Wetland 3 in the southwest area of the site does not appear to meet any of the IWLC exclusion criteria – this small wetland appears to be a remnant wetland on the site, based on the information reviewed. Therefore, this small wetland will remain a regulated IWLC under SMC's jurisdiction. Proposed impacts to Wetland 3 will require written authorization from SMC (impacts to this non-high quality wetland would qualify for SMC's General Permit #2, as the wetland is less than 0.1 acre – no mitigation would be required).

We would like to be of assistance. If you have any questions, or would like to set up a meeting, please call our office at (847)377-7705 or e-mail Glenn Westman at <u>gwestman@lakecountyil.gov</u>. If you have any additional concerns that have not been addressed by the regulatory staff, you may contact Chief Engineer Kurt Woolford <u>kwoolford@lakecountyil.gov</u> or Executive Director Michael Warner <u>mwarner@lakecountyil.gov</u> at (847)377-7700.

Glenn H. Westman Principal Wetland Specialist Lake County Stormwater Management Commission (SMC) 500 W. Winchester Road, Suite 201 Libertyville, IL 60048 Phone: (847)377-7718 Fax: (847)984-5747 E-Mail: gwestman@lakecountyil.gov

Please consider the environment before printing this e-mail

**From:** Vince Mosca [mailto:vmosca@heyassoc.com] . **Sent:** Thursday, July 12, 2012 3:43 PM

To: Westman, Glenn H.

**Cc:** 'Glenn R. Luke'; 'Jennifer M. Kahler'; nmprasad@integrysgroup.com; mpjouras@integrysgroup.com **Subject:** WDP No. 02-47-214A - Materials for Pre-application Meeting

#### Glenn:

Please find attached our cover letter and background information for discussion at our pre-app meeting on Monday. Let me know if you'd like me to bring a hard copy.

Call with any initial questions.

Vince

Vincent Mosca Sr. Ecologist Hey and Associates, Inc. 26575 W. Commerce Drive Suite 601 Volo, Illinois 60073

847-740-0888 office 847-740-2888 fax 847-404-3303 mobile



#### STORMWATER MANAGEMENT COMMISSION

August 6, 2012

Mr. Naren M. Prasad Integrys Business Support 130 East Randolph Street, 22nd Floor Chicago, IL 60601

RE: WDP No. 02-47-214A North Shore Gas Property at SEC Dahringer and Pershing Roads; Waukegan, Illinois PIN # 08-15-300-030 ISOLATED WETLAND EXCLUSIONS

#### Dear Mr. Prasad:

This letter is a follow-up to the preliminary jurisdictional determination (PJD) letter for the subject property issued by the Lake County Stormwater Management Commission (SMC) on June 11, 2012 (copy enclosed for reference). Based on supplemental information provided on your behalf by Hey & Associates, Inc. (Hey), received by the SMC on July 12, 2012, it is our determination that Wetlands 1 and 2 shown on the enclosed Exhibit 7 are excluded from regulation under the Lake County Watershed Development Ordinance (WDO). Specifically, these two wetlands appear to meet exclusion criterion a.(2) under the definition of *Isolated Waters of Lake County* in WDO Appendix A: "Excavations and impoundments permitted by right, prior to being a regulated activity, within 40% or more non-hydric soils."

Wetland 3 shown on the enclosed Exhibit 7 does not appear to meet the WDO exclusion criteria; therefore, this wetland remains a regulatory IWLC under the jurisdiction of the SMC.

#### Permitting Considerations:

The WDO requires that a Watershed Development Permit (WDP) be issued by the City Waukegan for proposed development of the property. Please contact Mr. Ron Laubach, the City's WDO enforcement officer, at (847)625-6827 for the WDP submittal requirements. <u>SMC's written authorization will be required for any proposed impacts to Wetland 3 prior to the City's issuance of the WDP.</u>

If you have any questions, or would like to set up a meeting, please call our office at (847)377-7705 or e-mail me at <u>gwestman@lakecountyil.gov</u>. If you have any additional concerns that have not been addressed by the regulatory staff, you may contact Chief Engineer Kurt Woolford <u>kwoolford@lakecountyil.gov</u> or Executive Director Michael Warner <u>mwarner@lakecountyil.gov</u> at (847) 377-7700.

500 W. Winchester Road • Libertyville, Illinois 60048 • 847/377-7700 • FAX 847/984-5747

Mr. Prasad WDP NO. 02-47-214A August 6, 2012 Page 2 of 2

If you would like to provide feedback regarding the SMC permit/inspection process please go to: (password – *survey*)

www.lakecountyil.gov/Stormwater/Pages/permit-process-survey.aspx www.lakecountyil.gov/Stormwater/Pages/inspection-process-survey.aspx

Sincerely,

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION

Kat woolfal

Kurt Woolford, P.E., CFM Chief Engineer

Glenn H. Westre

Glenn H. Westman, PWS, CWS, CFM Principal Wetland Specialist

Enclosure: SMC's PJD Letter Dated 6-11-12 with Wetland Exhibit 7 (Hey)

c: Ron Laubach – City of Waukegan Mike Jouras – Integrys Group Scott Kuykendall & Vince Mosca – Hey and Associates Glenn Luke - NRT

We transmitted this document via email. Please print out a copy of the document and retain for your records. If you are unable to print the document, or desire a hard copy mailed to you, please notify SMC at your earliest convenience.

# APPENDIX D

# PERIMETER AIR MONITORING ACCEPTABLE AIR CONCENTRATIONS – TECHNICAL MEMORANDUM

Technical Memorandum July 27, 2012

1800 Diagonal Road, Suite 500 Alexandria, VA 22314

# Site-Specific Time Critical Removal Action Perimeter Air Monitoring Acceptable Air Concentrations

As part of the focused time critical removal action project to be performed at the North Shore Gas Company's former North Plant Manufactured Gas Plant (MGP) (Site) in Waukegan, Illinois, air monitoring will be conducted to measure the concentrations of MGP-related constituents associated with the removal action. Two types of air monitoring will be conducted during the project.

The first type will be real-time air monitoring of specific constituents (total volatile organic compounds [TVOCs], particulate matter less than 10  $\mu$ m in size [PM₁₀]) conducted with stationary air monitoring instruments as described in the air monitoring plan (AMP) presented in the *Removal Action Work Plan* developed by Natural Resource Technology, Inc. The real-time air monitoring stations will be located at the perimeter of the Site. These real-time measurements will be collected using automated air sampling and analysis devices at a specified sampling interval (e.g., every 15 minutes) over the entire day and compared in real-time to the perimeter Action Levels presented in the AMP. Any exceedance of the Action Levels will require specific response measures by the removal action contractor to reduce the vapor and/or particulate phase emissions. Also, in the event that the TVOC Action Level is exceeded, the real-time monitoring will include automated collection of constituent-specific data (benzene, toluene, ethylbenzene, and xylenes [BTEX]).

The second type of air monitoring will be done using stationary sampling devices that take integrated air samples over a 24-hour period to measure the concentrations of MGP-related constituents at the Site perimeter (i.e., the fence line). These samples are then sent to an offsite laboratory for analysis. These air concentrations will be compared to the acceptable air concentrations (AACs) developed to be protective of public health, as described in this technical memorandum. The goal of the air monitoring program is to maintain air concentrations at the secured perimeter of the Site, as measured in the integrated 24-hour samples, at levels below applicable AACs.

1

Exponent was requested by Integrys Business Support, LLC (IBS) to develop AACs for the removal action project. The AACs were developed to be protective of the residents living nearby, as they are the most sensitive population located in the Site area. The AACs were developed using U.S. Environmental Protection Agency (EPA) risk assessment methods, the most current available toxicity data, physical parameter information, and by applying site-specific exposure parameters that consider the nature of the removal project (U.S. EPA 2009a-d, 2012a,b). These site-specific AACs were developed based on the fact that the only potential exposure pathway for nearby residents for chemicals associated with the removal action project (i.e., soil removal) would be inhalation of fugitive air emissions, as the Site will remain secured with a perimeter fence. These fugitive air emissions would be in the form of dust for those MGP-constituents that are relatively non-volatile (e.g., high-molecular-weight polycyclic aromatic hydrocarbons [PAHs]) and as chemical vapors for volatile MGP constituents (e.g., benzene and naphthalene).

The specific MGP-related constituents for which AACs were developed were those that are typically evaluated for MGP projects because of their volatility and/or toxicity, including BTEX and eight specific PAHs. In addition, the health-based value developed by EPA for dust (i.e.,  $PM_{10}$ ) was adopted to address health concerns associated with particulate matter or dust.

The Site is a vacant parcel located about one-half mile west of Lake Michigan. The EJ&E railway is located along the eastern perimeter of the Site, Pershing Road is along the western perimeter, and Dahringer Road is along the northern perimeter. Further west is the Amstutz Expressway, a four-lane divided highway. The closest resident is located west of the cxpressway approximately 600 ft to the west of northwest corner of the Site. The closest industrial area is about 750 ft south of the Site. The perimeter fence is the closest location to the active removal project where the general public could potentially be exposed to fugitive emissions, as the general public will not have access to the Site. The AACs were developed using a conservative approach, so that if exposure to MGP-related constituents occurred at the secured perimeter over the entire duration of the removal project for 24 hours per day, the exposure would not pose a health concern to the general public. As distance from the Site increases, air concentrations will be diluted and reduced in concentration relative to those

2

measured at or near the Site. The calculations used to derive the AACs are described below, followed by the specific exposure and toxicity factors used as inputs. The resultant AACs are presented in Table 1.

## **Equations and Methods Used to Derive AACs**

### Equations

The equations used to calculate the AACs were derived from current EPA guidance for inhalation exposures, as presented in the user's guide for EPA's regional screening levels (U.S. EPA 2012a).

For this Site, the exposure terms were simplified because the exposure duration is short (i.e., approximately a year) because of the nature of the planned removal action, yielding the following site-specific equations for developing the AACs. The equations differ slightly for noncarcinogenic and carcinogenic effects of a chemical. The input values and definitions of all abbreviations are provided in Table 1.

### Noncarcinogenic

AAC noncarc (mg/m³) =  $\frac{\text{THQ} \times \text{AT}(\text{noncarc})}{\text{EF} \times \text{ET} \times (1 \text{ day}/24 \text{ hrs}) \times (1/\text{RfC})}$ 

#### Carcinogenic

AAC carc (mg/m³) =  $\frac{\text{TR} \times \text{AT}(\text{carc})}{\text{EF} \times \text{ET} \times (1 \text{ day}/24 \text{ hrs}) \times \text{IUR} \times 1000}$ 

For noncarcinogens, a target hazard quotient of 1 was used to estimate the AACs. For carcinogens, AACs were calculated using three different target risk levels of  $1 \times 10^{-4}$ ,  $1 \times 10^{-5}$ , and  $1 \times 10^{-6}$ , so that values could be developed that spanned the risk range typically considered when assessing cancer risks at Comprehensive Environmental Response, Compensation and

#### Technical Memorandum July 27, 2012

Liability Act of 1980 (CERCLA) sites. Cumulative risks within the risk range are considered potentially acceptable depending upon site-specific circumstances that are evaluated by EPA. Cumulative risks above  $1 \times 10^{-4}$  are not typically considered acceptable. The goal will be to manage fugitive air emissions during the removal action such that air concentrations are as low as practically possible. Thus on average, the goal will be to meet AACs that are at the lower end of the risk range, and if possible below the range presented in Table 1.

For chemicals for which both cancer- and noncancer-based toxicity values are available (i.e., benzene, ethylbenzene, and naphthalene), the AACs were calculated using both sets of toxicity values. When the noncancer-based AAC was lower than the cancer-based AAC (for a particular risk level), the noncancer-based AAC was selected to be health protective, and is indicated with a box in Table 1. Typically, at the  $1 \times 10^{-6}$  risk level, the cancer-based values are lower than the noncancer-based values, but as the target risk level for carcinogens is increased (i.e., from  $1 \times 10^{-6}$ , to  $1 \times 10^{-5}$ , to  $1 \times 10^{-4}$ ), the noncancer-based AAC may be lower than the cancer-based value. This situation occurs for benzene at the  $1 \times 10^{-4}$  and the  $1 \times 10^{-5}$  risk levels and for naphthalene at the  $1 \times 10^{-4}$  risk level, indicating the cancer-based values for benzene and naphthalene in these cases are not health protective for noncancer-based effects and cannot be used as AACs.

#### **Exposure Factors**

The following section explains the basis for the site-specific exposure factors used to develop the AACs for the residential population near the Site. The toxicity values addressed later in this document were developed in a conservative manner to be health protective for sensitive human populations, including children, and were used following the most current inhalation dosimetry methodology, thus do not require normalization to body weight and daily inhalation rate (U.S. EPA 2009e).

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#### Exposure Frequency and Exposure Time

The duration of the removal action is planned to be approximately 1 year (52 weeks), with activities that could potentially lead to fugitive emissions (e.g., active excavation of soil to remove historical structures and *in situ* stabilization/solidification of contaminated soil) potentially occurring during the entire period. During active construction, excavated soil will be loaded onto trucks for offsite disposal as soon as possible to minimize stockpiling. Stockpiles left during non-working hours will be covered with a vapor-phase suppressant foam and/or a tarp to minimize fugitive air emissions. If necessary, additional engineering controls, such as a misting system or fan, will be used to control fugitive emissions from the Site.

Work schedules at this Site may vary in terms of number of hours per day or number of days per week worked. Therefore, the AACs were conservatively developed using the assumptions that emissions could occur 24 hours per day, 7 days per week during the entire year-long duration of the project (Table 1). These exposure assumptions also correspond to the air monitoring sampling period (24 hours/day) that will be used for collecting the integrated air samples.

#### Averaging Time

For carcinogens, the averaging time is the full lifetime of an individual, assumed to be 70 years (equivalent to 25,550 days) based on EPA risk assessment guidelines (U.S. EPA 1989).

For noncarcinogens, the averaging time is limited to the duration over which exposure may occur based on the same EPA risk assessment guidelines (U.S. EPA 1989). For this site-specific scenario, exposures may occur intermittently over the entire year, so the averaging time for noncarcinogens is 365 days.

## **Toxicity Values**

Toxicity values used are presented in Table 1. Values used were obtained from EPA's Integrated Risk Information System (IRIS, U.S. EPA 2012b), EPA's provisional peer-reviewed toxicity values (PPRTVs, U.S. EPA 2009a-d), and the California Environmental Protection

#### Technical Memorandum July 27, 2012

Agency (Cal-EPA 2009). For noncarcinogenic effects of chemicals, reference concentrations (RfCs) were used to assess the toxicity of the MGP-related constituents. RfCs are available for BTEX and naphthalene. For carcinogenic effects, inhalation unit risk (IUR) factors were used to assess the MGP-related constituents. There are IUR values for benzene, ethylbenzene, and the eight PAHs.

For noncarcinogens, subchronic rather than chronic toxicity values were used. EPA defines a subchronic exposure duration as one lasting more than 30 days up to 10% of a lifetime in humans, which would be 7 years (U.S. EPA 2011). Thus, the 1-year total duration of this project is more appropriately considered a subchronic exposure period, rather than a chronic exposure period. EPA provides PPRTVs for subchronic exposures for benzene, ethylbenzene, and xylenes, which were used in Table 1 (U.S. EPA 2009a-c). For toluene, the PPRTV document recommends the use of the chronic value for subchronic exposures (U.S. EPA 2009d).

For naphthalene there are no subchronic inhalation toxicity values. The EPA chronic RfC for naphthalene is based on a 2-year mouse study where nasal inflammation was observed in mice chronically exposed to naphthalene. EPA did not note additional adverse effects at or near the dose level used to derive the RfC. Nasal inflammation is a reversible effect, meaning once exposure ends, the inflammation will subside. The estimated human equivalent concentration of naphthalene that would cause the nasal inflammation based on this study was 9 mg/m³ (U.S. EPA 1998, 2012b). This human equivalent concentration was used by EPA with an uncertainty factor of 3,000 to derive the chronic naphthalene RfC of 0.003 mg/m³. The 3,000-fold uncertainty factor is based on the following:

- A 10-fold factor for extrapolation from an adverse-effect-level to a noadverse-effect-level
- A 10-fold interspecies extrapolation factor to account for the differential sensitivity of humans compared to other animals (e.g., mice)

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- A 10-fold intraspecies extrapolation factor to account for the difference in sensitivity among humans
- An additional 3-fold factor was included because there were deficiencies in the toxicology data available (e.g., lack of reproductive data).

As the period of exposure for this short-term project will be clearly subchronic in nature, a subchronic RfC was desired to more closely match the short-term exposure period. To estimate a subchronic inhalation toxicity value for naphthalene, EPA's chronic RfC (0.003 mg/m³) was multiplied by a 10-fold factor to adjust from a no-adverse-effect-level over a *chronic* period of exposure to a no-adverse-effect-level over a *subchronic* exposure period (i.e., 0.03 mg/m³).

The seven PAHs listed in the attached table, other than naphthalene, are compounds that have been classified by EPA as probable human carcinogens for decades and are normally evaluated as such. Benzene is classified as a known human carcinogen, and there is an IUR available for it in IRIS. However, only oral cancer-based toxicity values (i.e., slope factors) have been developed for these seven PAHs by EPA. The oral cancer slope factor for benzo[a]pyrene is presented in IRIS while the values for the other six PAHs are based on a potency factor relative to benzo[a]pyrene (U.S. EPA 1993). However, Cal-EPA has developed inhalation toxicity values for these seven PAHs, which were used in the calculation of the AACs. The classification of naphthalene and ethylbenzene as to whether they are considered carcinogens is currently under review by EPA (U.S. EPA 2004, 2012b). However, Cal-EPA has developed cancer-based inhalation toxicity values for these two compounds. AACs for naphthalene and ethylbenzene were developed using both cancer and noncancer toxicity values, with the lowest value being selected as the AAC.

# **Estimated AACs and Application of AACs**

The estimated AACs are presented in Table 1. Integrated air sample results collected over a 24-hour period will be compared to the AACs in Table 1 for each of the volatile constituents (i.e., BETX and naphthalene). While naphthalene is a volatile PAH that will be present in the

vapor phase in air, the other seven PAHs for which AACs were developed (i.e., benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyrene) are relatively non-volatile. These seven non-volatile PAHs are bound on the particulate matter or dust generated during the soil removal process rather than present as a vapor (like naphthalene) in air. For these seven PAHs, two sampling methods will initially be used to evaluate compliance with the AACs, including integrated air sampling, and real-time air sampling of dust using a DustTrac monitor. Integrated air sampling methods (i.e., using polyurethane foam (PUF) sampling media) will be used to directly measure the air concentration of the seven PAHs in the dust over a 24-hour period. The integrated air sample results using the PUF sampling method will be compared to the applicable AACs listed in Table 1.

In addition, the ambient air respirable dust concentration (i.e.,  $PM_{10}$ ) will be measured using a real-time DustTrac monitor over the same 24-hour period that the PUF samples are collected. The measured dust concentration will be compared to the  $PM_{10}$  standard in Table 1. The realtime dust monitoring will be used to indirectly monitor if the AACs for the seven non-volatile PAHs are achieved when the  $PM_{10}$  standard is achieved. Based on the maximum concentrations of each of the seven non-volatile PAHs detected in soil in the Removal Action Area, the maximum air concentrations of each PAH that could be generated if the PM₁₀ standard (i.e.,  $0.15 \text{ mg/m}^3$ ) is achieved were estimated (Table 2). The predicted maximum air concentration of each non-volatile PAH (assuming the dust concentration was equivalent to the  $PM_{10}$ ) was compared to its AAC that was developed using a target cancer risk of  $1 \times 10^{-5}$ , which is in the middle of the acceptable target risk range (Table 2). In each case, the maximum predicted air concentration of each non-volatile PAH was much less than the selected AAC (Table 2). For this reason, as long as the  $PM_{10}$  air standard is achieved, the air concentrations of each of the seven non-volatile PAHs are predicted to be below their respective AACs based on a target risk of  $1 \times 10^{-5}$ . If the PUF samples collected concurrently with the DustTrac dust monitoring yield PAH air concentrations below the AACs during the initial period of sampling this will verify the presumably conservative nature of the predicted air concentrations in Table 2. Once this verification is completed with the PUF sampler and if the air concentrations of the non-volatile PAHs are much lower than their AACs, then the achievement of the AACs

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for these non-volatile PAHs may be monitored indirectly by measuring the  $PM_{10}$  concentration (i.e., using a DustTrac hand held monitor), rather than using PUF samplers.

Prior to beginning the removal action, concentrations of the MGP-related constituents will be measured to evaluate baseline levels in the Site area. It is expected that the ambient or background air concentrations of the MGP-related constituents will be much lower than the AACs and will not contribute significantly to the daily air concentrations measured at the secured perimeter. If significant baseline air concentrations are detected (i.e., near the AACs), then the AACs will be reassessed to account for this contribution. Specifically, the AACs based on noncancer effects need to be achieved when considering the cumulative air emissions from both the removal action and baseline ambient conditions to maintain protection of the public. For the AACs based on carcinogenic effects, the point of comparison will be the incremental increased air concentration attributable to the remedial action (i.e., the incremental air concentration measured above the baseline conditions).

Once the removal action begins, the project will be managed to minimize fugitive air emissions. The first line of information used to make management decisions to control fugitive air emissions will be real-time monitoring and comparison to perimeter air Action Levels. These Action Levels are guidelines and not health-based concentration limits. The primary management goal will be to minimize fugitive air emissions to meet the AACs presented in Table 1, as the AACs are health-based concentrations.

For chemicals with only known noncarcinogenic effects (e.g., toluene and xylenes), there is a single noncarcinogenic-based AAC; thus, air concentrations above that value will be considered an exceedance of the AAC, which will require consideration of taking additional actions to reduce fugitive emissions at the Site. For chemicals that are potentially carcinogenic, the daily incremental air concentrations above background will be considered acceptable if they are within the AAC target risk ranges presented within Table 1 (i.e.,  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ ), as long as the cancer-based AAC at a given target risk does not exceed the noncancer-based AAC (see Table 1). An incremental air concentration above background that is greater than the AAC based on a  $1 \times 10^{-4}$  target risk level will be considered an exceedance that requires considering

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additional actions to reduce fugitive emissions. However, any air concentration greater than the lowest AAC for a specific analyte will be viewed by IBS and their contractors as a need to review the process used to manage fugitive emissions. Because Action Levels will be used with real-time monitoring as the first line of defense to minimize fugitive air emissions, exceedances of the AACs will reflect the need to review Action Levels and the real-time monitoring program to determine if lower Action Levels are required, or if more focused real-time monitoring is needed to better manage fugitive emissions.

It is important to note that the AACs are representative of the average concentrations to which a residential receptor could be exposed without exceeding the target risk level over the exposure period (i.e., 1-year project duration). Therefore, cumulative averages over the duration of the project are a more appropriate comparison value than single-day measurements for meeting the overall project goal of protecting the public. While daily concentrations will be used as a guide to address the need for reviewing the fugitive emission controls, the overall goal of meeting the AACs will be based on the average concentrations achieved over the project duration. If the project duration is extended significantly because of unforeseen circumstances, AACs may need to be adjusted. However, whether adjusting the AACs is necessary will be determined based on the performance of the removal action up to the time that a project extension is first anticipated. The expectation is that the average air concentrations measured during the removal action will be maintained far enough below the calculated AACs that an extension of the project duration would not present any likelihood that the cumulative target risk goal (i.e., hazard quotient of 1 or within the risk range) would be exceeded. Therefore, unless this expectation is not met, the AACs should not need to be adjusted. A comparison of the integrated air monitoring data to the AACs will be part of the completion report prepared once the removal action is complete.

Lastly, these AAC values implicitly assume that a receptor will be near the Site for 24 hours a day during the entire project. If residents spend any of their time in a different location, actual risks will be lower.

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Table 1. Site-specific time critical removal action perimeter air monitoring acceptable air concentrations: Residential exposure scenario

| · · · · · · · · · · · · · · · · · · ·               |                  |                       |                    |                         |                      |                |                               |               | Site-Speci           | fic Accepta | ble Air Conc                  | entrations |                      |             |                             |           |
|-----------------------------------------------------|------------------|-----------------------|--------------------|-------------------------|----------------------|----------------|-------------------------------|---------------|----------------------|-------------|-------------------------------|------------|----------------------|-------------|-----------------------------|-----------|
|                                                     | Noncancer<br>RfC | Cancer<br>IUR         | Bas                | is and Source           | at                   |                | Cancer Risk:<br>and Quotient: |               |                      |             | Cancer Risk;<br>ird Quotlent: |            | at                   |             | Cancer Risk<br>and Quotient |           |
| Constituent                                         | (mg/m³)          | (µg/m³) ⁻¹ | of Toxicity Values |                         | (mg/m ^a ) | ng/m³) (µg/m³) | (ppmv)                        | (ppmv) (ppbv) | (mg/m ^a ) | (µg/m³)     | (ppmv)                        | (ppbv)     | (mg/m ³ ) | (µg/m³) (p) | (ppmv)                      | (ppbv)    |
| Benzene (cancer)<br>Benzene (noncancer, subchronic) | 0.080            | 7.8E-06               | C<br>NC            | IRIS<br>PPRTV           | 0.90                 | 900<br>80      | 0.28                          | 280<br>25     | 0.090                | 90<br>80    | 0,028                         | 28         | 0.0090               | 9,0<br>80   | 0.0028                      | 2.8<br>25 |
| Toluana                                             | 5,0              | -                     | NC                 | IRIS                    | 5.0                  | 5,000          | 1.3                           | 1,300         | 5,0                  | 5,000       | 1.3                           | 1,300      | -5.0                 | 5,000       | 1.3                         | 1,300     |
| Ethylbenzene (cancer)*                              | -                | 2,5E-06               | С                  | Cal-EPA                 | 2.8                  | 2,800          | 0,65                          | 650           | 0.28                 | 280         | 0.065                         | 65         | 0.028                | 28          | 0.0065                      | 8.5       |
| Ethylbenzene (noncancer, subchronic)                | 9.0              | -                     | NC                 | PPRTV                   | 9.0                  | 9,000          | 2.1                           | 2,100         | 9.0                  | 9,000       | 2.1                           | 2,100      | 9.0                  | 9,000       | 2.1                         | 2,100     |
| Xylenes (subchronic)                                | 0.40             | -                     | NC                 | PPRTV                   | 0.40                 | 400            | 0.092                         | 92            | 0.40                 | 400         | 0.092                         | 92         | 0.40                 | 400         | 0.092                       | 92        |
| Naphihalene (cancer)*                               | -                | 3.4E-05               | С                  | Cal-EPA                 | 0,21                 | 210            | 0.039                         | 39            | 0.021                | 21          | 0,0039                        | 3.9        | 0.0021               | 2.1         | 0.00039                     | 0.39      |
| Naphihalene (noncancer, subchronic)                 | 0,030°           |                       | NC                 | IRIS"                   | 0.030                | 30             | 0.0057                        | 5,7           | 0.030                | 30          | 0.0057                        | 5.7        | 0.030                | 30          | 0.0057                      | 5.7       |
| Benziaanthracene                                    |                  | 1,1E-04 ·             | С                  | Cal-EPA                 | 0.064                | 64             | 0.0068                        | 6,8           | 0.0064               | 6.4         | 0.00068                       | 0.68       | 0.00064              | 0.64        | 6.8E-05                     | 0.068     |
| Benzo[a]pyrene ^b                         |                  | 1.1E-03               | С                  | Cal-SPA                 | 0.0064               | 6.4            | 0.00062                       | 0.62          | D.00064              | 0.64        | 6.2E-05                       | 0.062      | 6.4E-05              | 0.064       | 6.2E-06                     | 0,0062    |
| Benzo[b]fluoranthene*                               |                  | 1.1E-04               | С                  | Cal-EPA                 | 0.064                | 64             | 0,0062                        | 6.2           | 0.0064               | 6.4         | 0,00062                       | 0.62       | 0,00064              | 0.64        | 6.2E-05                     | 0.062     |
| Benzo(k)fluoranthene ^b                   |                  | 1.1E-04               | C                  | Cal-EPA                 | 0,064                | 64             | 0,0062                        | 6,2           | 0,0064               | 6.4         | 0.00062                       | 0.62       | 0,00064              | 0,64        | 6,2E-05                     | 0,062     |
| Chrysene ^b                               |                  | 1.1E-05               | С                  | Cal-EPA                 | 0.64                 | 640            | 0.068                         | 68            | 0.064                | 64          | D.0058                        | 6.B        | 0.0064               | 6.4         | 0.00068                     | 0.68      |
| Dibenz[a,h]anthracene ^b                  |                  | 1.2E-03               | С                  | Cal-EPA                 | 0.005B               | 5.8            | 0.00051                       | 0.51          | D.00058              | 0.58        | 5.1E-05                       | 0.051      | 5.8E-05              | 0.058       | 5.1E-06                     | 0.0051    |
| Indenc[1.2,3-cd]pyrene ^b                 |                  | 1.1E-04               | С                  | Cal-EPA                 | 0.064                | 84             | 0.0056                        | 5,6           | 0.0064               | 6.4         | 0.00056                       | 0.56       | 0.00064              | 0.64        | 5.6E-05                     | 0.056     |
| PM ₁₀                                    | -                |                       | NAA                | QS for PM ₁₀ | 0,15                 | 150            | · _                           | -             | 0,15                 | 150         | _                             |            | 0.15                 | 150         |                             | -         |

Averaging Time (AT) (carc) = Averaging Time (AT) (noncarc) Exposure Frequency (EF) Exposure Time (ET)

70 years (lifetime)
25,650 days
365 days (reflects 52 weeks total duration of project)

365 days (reflects number of days removal of contaminated material occurs and time a resident would be in area, 52 weeks × 7 days/week)

24 hours/day (reflects number of hours a resident might be exposed)

#### Notes and Footnotes:

AAC equations, texicity values, and sources based on EPA's regional screening levels (http://www.epa.gov/region9/superfund/prg/), which were last updated May 2012.

All AACs are rounded to two significant figures.

For noncarcinogenic effacts, subchronic values were used when available. For toluene, the subchronic value was the same as the chronic value.

When both cancer-based and noncancer-based AACs were evailable for a particular chemical, the lowest value (for a particular risk level) was selected to be health protective, and is indicated with a box.

^a Classification of naphalene and ethylbenzene is currently under review by EPA. Also see U.S. EPA (2004).

^b The PM₁₀ NAAQS of 150 µg/m³ would also be protective of potential exposures to PAHs in dust.

°A subchronic RfC was estimated based on the chronic RfC. Refer to the text for details,

| AAC - acceptable air concentration                 | IUR – inhalation unit risk                                    | PPRI  |
|----------------------------------------------------|---------------------------------------------------------------|-------|
| Cal-EPA California Environmental Protection Agency | NAAQS – national ambient air quality standard                 | RfC - |
| C - AAC based on cancer endpoint                   | NC – AAC based on noncancer endpoint                          | THQ   |
| EPA – U.S. Environmental Protection Agency         | PAH – polycyclic aromatic hydrocarbon                         | TR –  |
| IRIS – Integrated Risk Information System          | PM ₁₀ - particulate matter less than 10 µm in size |       |

 $\label{eq:PRTV} Provisional peer-reviewed toxicity values (U.S. EPA; http://hhpprtv.ornl.gov/quickview/pprtv_papers.php) RIG – reference concentration THQ – target hazard quotient THQ – target hazard quotient TR – target risk (carchinogenic)$ 

Air concentrations converted using the formula: (Concentration in mg/m³) = (Concentration in ppm) × (Molecular Weight/24.45) taken from U.S. EPA: http://www.epa.gov/iris/subst/0276.htm.

Molecular weights taken from EPA, regional screening values: http://www.epa.gov/region9/superfund/prg/.

| Conversion 1 ppm to    | mg/m³ | ,                                                                                                                 |
|------------------------|-------|-------------------------------------------------------------------------------------------------------------------|
| Benzene                | 3,19  |                                                                                                                   |
| Toluene                | 3.77  | Noncarcinogenic                                                                                                   |
| Elhylbenzene           | 4,34  | THQ × AT(noncarc)                                                                                                 |
| Xylenes                | 4.34  | AAC noncarc (mg/m ³ ) = EF × ET × (1 day/24 hrs) × (1/RfC)                                             |
| Naphthatene            | 5.24  | · · · · · · · · · · · · · · · · · · ·                                                                             |
| Benz[a]anthracene      | 9.34  | i di seconda di seconda di seconda di seconda di seconda di seconda di seconda di seconda di seconda di second    |
| Benzo[a]pyrcne         | 10.32 |                                                                                                                   |
| Benzo[b]fluoranthene   | 10.32 | Carcinogenic                                                                                                      |
| Benzo[k]/luoranthene   | 10.32 | TR × AT(carc)                                                                                                     |
| Chrysene               | 9.34  | AAC carc $(mg/m^3) = \frac{\Gamma R \times AT(carc)}{EF \times ET \times (1 day/24 hrs) \times IUR \times 1,000}$ |
| Dibenz[a,h]anthracene  | 11.38 |                                                                                                                   |
| Indeno[1,2,3-cd]pyrene | 11.30 |                                                                                                                   |

|                        | Maximum Soil<br>Concentration ^a | Maximum Predicted Air<br>Concentration ^b | Residential Acceptable Air<br>Concentration ^c | Risk Ratio ^d |
|------------------------|--------------------------------------------|-----------------------------------------------------|----------------------------------------------------------|-------------------------|
| Constituent            | (mg/kg)                                    | (mg/m ³ )                                | (mg/ <b>m</b> ³ )                             | (unitless)              |
| Benz[a]anthracene.     | 960                                        | 0.000144                                            | 0.0064                                                   | 0.023                   |
| Benzo[a]pyrene         | · 810                                      | 0.000122                                            | 0.00064                                                  | 0.19                    |
| Benzo[b]fluoranthene   | 630                                        | 0.000095                                            | 0.0064                                                   | 0.015                   |
| Benzo[k]fluoranthene   | 420                                        | 0.000063                                            | 0.0064                                                   | 0.0098                  |
| Chrysene               | 970                                        | 0.000146                                            | 0.064                                                    | 0.0023                  |
| Dibenz[a,h]anthracene  | 88                                         | 0.000013                                            | 0.00058                                                  | 0.023                   |
| Indeno[1,2,3-cd]pyrene | 300                                        | 0.000045                                            | 0.0064                                                   | 0.0070                  |

# Table 2. Maximum predicted ambient concentrations in air for particulate-related constituents North Plant MGP Site, Waukegan, Illinois

^a Maximum soil concentrations listed are based on the highest concentration of each constituent sampled from within the proposed excavation areas. The highest concentrations were obtained from soil boring locations SB42-001 (6–8'), SP136-002 (4–6'), and SP156-002 (8–10').

^b Based on an action level for PM₁₀ of 0.15 mg/m³ and calculated using the concentration of each constituent in soil as the assumed concentration of the constituent in airborne respirable dust.

^cAcceptable air concentration (AAC) for a resident based on a 1×10⁻⁵ target risk (from Table 1).

^d Risk ratio represents the ratio of the maximum predicted air concentration over the AAC. A value less than 1 represents an air concentration below the selected target risk level.

# APPENDIX E

# WASTE DISPOSAL PROFILE



## Profile Addendum: State of Illinois GENERATOR'S CERTIFICATION OF SPECIAL WASTE STATUS

| F. Additional Waste Stream Information                                                                                                                                  |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|                                                                                                                                                                         |                        |
| Profile Number: EF 1496                                                                                                                                                 | ·                      |
|                                                                                                                                                                         |                        |
| Generators Name: Former North Plant Site                                                                                                                                |                        |
|                                                                                                                                                                         |                        |
| Generators SITE Address: Undeveloepd parcel southeast of Pershing Rd. and Dehringer Rd, W                                                                               | aukegan, IL            |
| (The location where the waste is generated)                                                                                                                             | · · ·                  |
| Waste Name: MGP contaminated soil                                                                                                                                       | · _ · ·                |
| The Illinois Pollution Control Act allows a Generator to certify that their pollution control waste or industria                                                        | I process worth is not |
| an Illinois Special Waste (Section 3.45). By completing the following questionnaire, you may certify that the                                                           | •                      |
| represented by the Waste Management Profile referenced above is not an Illinois Special Waste as defined in                                                             |                        |
|                                                                                                                                                                         |                        |
| Is the waste referenced above any of the following:                                                                                                                     |                        |
| 1. A Potentially Infectious Medical Waste (PIMW)?                                                                                                                       | 🛛 Yes 🗳 No             |
| 2. A Hazardous Waste as defined in 40 CFR 261 or in 35 IAC 722.111?                                                                                                     | 🛛 Yes 🗹 No             |
| 3. A Liquid Waste (fails the paint filter test as defined in 35 IAC 811.107)?                                                                                           | 🖸 Yes 🗹 No             |
| 4. A regulated PCB waste as defined in 40 CFR 761?                                                                                                                      | 🛛 Yes 🗳 No             |
| 5. A NESHAP regulated asbestos waste other than waste from renovation or demolition?                                                                                    | 🛛 Yes 💆 No 💡           |
| 6. A waste resulting from the shredding recyclable metals (auto fluff)?                                                                                                 | Yes M No               |
| 7. A de-listed or de-characterized hazardous waste, subject to LDR requirements under 35 IAC 728.107?                                                                   | Yes V No               |
| To determining that this make is not a limit. There was from date of the survivors around the start to                                                                  |                        |
| In determining that this waste is not a liquid, I have used knowledge of the processes generating the waste supporting documentation:                                   | and the attached       |
| supporting documentation. Composition Contractication Content (explain below).                                                                                          |                        |
| Profile established in 2002 and extended in 2004.                                                                                                                       |                        |
| In determining that this waste is not RCRA hazardous, I have used knowledge of the processes generating the                                                             | waste and the attached |
| supporting documentation: 🛛 MSDS 🖓 Analytical 🗹 Other (explain below):                                                                                                  |                        |
|                                                                                                                                                                         |                        |
| MGP exemption                                                                                                                                                           |                        |
| 8. Is the waste represented by this profile sheet subject to the Illinois Solid Waste Management Act fee?                                                               | 🛛 Yes 🛛 No             |
|                                                                                                                                                                         |                        |
|                                                                                                                                                                         |                        |
| By signing below, I certify my waste is NOT an Illinois Special Waste, and that I understand that a person w                                                            |                        |
| falsely certifies that a waste is not special waste is subject to the penalties set forth in subdivision (6) of su<br>section 44 of the Illinois Pollution Control Act. | ubsection (n) of       |
|                                                                                                                                                                         |                        |
|                                                                                                                                                                         |                        |
|                                                                                                                                                                         |                        |
| Name: (Print) <u>Maren Prasad as rep for Integrys/North Shore Gas</u> Title: <u>Sr. Environmental</u>                                                                   | Engineer               |
| 11 UMA Manapl                                                                                                                                                           |                        |
| Signature: Date: <u>4/18/2012</u>                                                                                                                                       |                        |
|                                                                                                                                                                         |                        |
| ©2006 Waste Management, Inc.                                                                                                                                            | January 2005           |

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| Liquid Flash Point:<br>Physics and Chem-<br>communicity and chem-<br>constituents<br>ad<br>d. cloy & gravel<br>GP related conteminant<br>Oxidizer<br>SCartinogen<br>Does the waste repre-<br>n Section B.1.1)<br>Does the waste repre-<br>If res                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| Liquid Flash Point:<br>Physical and Cham<br>ommution and them<br>matiments<br>ad<br>1. clay & gravel<br>GP related contaminat<br>Carcinogen<br>Does the waste repre-<br>li yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Liquid Flash Point:<br>Physical and Cherry<br>operating and relative<br>matiments<br>ad<br>. clay & gravel<br>39 related conteminant<br>Doxidizer<br>SCarcinogen<br>Does the waste repres<br>Does the waste repres<br>If yes, concentrations<br>If yes, concentrations<br>If yes, volations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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J.<br>rect to the wasts only<br>Point oppoint<br>Robits wasts only<br>Point oppoint<br>Robits and in 40 CFF<br>Tons XY are<br>Marith Quar<br>wa Maisrial? (If 1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| (          | trending Confidential Marcoling opportunity produces and the formation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |                           |       |
| 1.         | is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                | CYBS ANO                  |       |
| •          | b. If a churacteristic hazardowi white, do underlying hazardowi constituents (UHCs) apply?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                |                           |       |
| 2.         | Doen the waste represented by this waste profile share contain any of the following possibles or h<br>Mathemychiar, Toxaphene, 2,4,D, 2,4,5-TP (rilvar), chierdane, Hoppohlar (and its opartic)?.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                | TYN SINO                  |       |
| <b>J</b> . | Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated alone-up?<br>If yes, succh Record of Decision (ROD), 104/106 or 122 order or court order that governs site of<br>mandated close-up, provide relevant documentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | lean-up activity. For smos     | TARE NO                   |       |
| 4.         | Does the waste represented by this wasts profile these contrin radiantive meterial, or is disposal<br>Regulatory Contriviation?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | •                              | TAR NO                    |       |
| <b>5</b> . | Does the weste represented by this want profile short contain concentrations of Polychiorinstad<br>by 40 CFR 7617 (250 ppm) of desired from a source 2 50 ppm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                | TYES STRO                 |       |
|            | a. If present, is the percentration based on a dry weight analysis?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | () yes () ho                   |                           |       |
| 6,         | Is the wasse represented by this waste profile shoes a do-listed or de-characterized hashedown waste<br>requirements under IL TI 35 728.103?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | e, subject to LDR              | TYES KINO                 |       |
| 7.         | is the worth represented by this waste profile about Subject to the Litineds Solid Waste Management<br>If no, explain,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | at Act feoTimerenesses         | TYES ONO                  | •     |
| 8.         | Does the waste profile sheet and all subchmean somether and accurate deteriptions of the waste<br>relevant information which the powersion of the denomics regarding known or suspected based                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | is pertoining to the wasse     |                           |       |
| 9,         | been deployed to the Contractory and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec | ted to the Constactor prior in | ⊠yes []no                 |       |
| 10,        | providing the warm to the Configurate ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | person who knowldgly and       | Øyes ⊡no                  |       |
|            | felsely confider that a waste is not special weeks is subject to the penalder sol forth in rubbivision<br>section 44 of the Ringer Follocion Control Act,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (6) of subsection (b) of       | TYPE KINO                 |       |
| 11,        | How has the generator demandined the watty is not a RCRA haspidous watte?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                | Analysis<br>MSDS<br>Other |       |
|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                | (expisin)                 |       |

#### Check here if a Conflorie of Desayetian or Disposel is required.

Any each be submined is representative as defined in 40 CPR 261 - Appendia 1 or by pains an equivalent stathed. I estherize WMI to obtain a sample from any waste thippents for purposes of recentification. If this conficted as made by a broker, converter, or consultant, the undersigned signs as sentenized again of the generator and has confinded the information contained in this Profile Short from information provided by the generator and additional information as a has a confined to be resembly measured. If engraved for many convector has all the necessary pointing and licenses for the waste that has been characterized and identified by the approved profile.

|                              |                                        |   | 200.000       |             |
|------------------------------|----------------------------------------|---|---------------|-------------|
| 14 Managaret Method Miles    | ochil Non-hazardour Solidificatio      |   |               |             |
| Management Method ML&        | andous Stabilization Other (Specify    |   | ,             |             |
|                              |                                        |   | sectisposed.  |             |
| Proposed Ultimate Managem    |                                        |   |               |             |
| FICCEUTIONS' SDECIAL SCREWIN | Procedures, or Limitation on Approval: |   |               |             |
|                              |                                        |   |               |             |
|                              |                                        |   |               |             |
| None.                        |                                        |   |               |             |
|                              |                                        |   |               |             |
|                              |                                        |   |               |             |
|                              |                                        |   |               |             |
|                              |                                        |   | Euclose Trate |             |
| Weste Form                   | 5. Şaurce                              | č | System Type   |             |
| Waste Form                   | 5. Şaurce                              |   | Approved T    | Disapproved |
| None.                        | 5. Şoures                              |   |               | Disapproved |

2002/002



#### WASTE MANAGEMENT, INC.

#### Annual Generator Special Waste Recertification for Disposal of Special Waste

Generator Name: North Shore Gas Co,

Profile Number: EF 1496

Illimois EPA ID Number: 0971903009

Generic Waste Name:, MCP contaminated soil

Process which generated waste: Remediation activities Former MGF site

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is true, accurate, and complete. I have used intimated knowledge of our process which generates the waste and certify that neither the process generating the waste nor the chemical or physical characteristics of the waste have changed since the pre-acceptance analysis was conducted on this waste. I am sware that there are significant penalties for knowingly submitting false information, including the possibility of fins and imprisonment.

For wasts being received for disposal, please certify one of the following by marking it with an "X":

X There have been no changes in the following since the Special Waste

Pre-acceptance form was filed:

1. Laboratory analysis (copies to be attached);

- 2. Raw material in the waste-generating process;
- 3. The waste-generating process itself;
- 4. The physical or hazardous characteristics of the waste; and
- 5. New information on the human health effects of exposure to the waste; or

Date:

The change in the physical of hazardous characteristic of the waste is not .

sufficient to require a now special waste profile.

Explain:

(Facility operation of duly authorized agent) Signature

07-01-04

Printed Name: Christopher F. Szela

Tillo: <u>Project Manager</u>

Note to Generator: Pre-acceptance analysis must be conducted at least every five years in accordance with the receiving facility's permit.

#T312 5'005\005

SEP-05-2002 14:34 FROM:

TO: 7086560684

PRGE:02



Special Waste Group 5245 W. 38^(h) Street Cicern, Itlinais 60804 708-222-5055

# WPS # EF 1496

Yes

Yes

Yes

Yes

No

Dear Generator,

Your waste has been found to contain reactive sulfide and/or cyanide in concentrations greater than 10 PPM, but less than 500 PPM for sulfides and 250 PPM for cyanides. The Illinois EPA has indicated that additional information concerning this waste stream will be required prior to landfill approval. Specifically:

Has the waste ever caused injury to a worker because of H2S or HCN generation? Have the OSHA workplace air concentration limits for either H2S or HCN been exceeded in areas where the waste 1s generated, stored, or otherwise handled?

Have nir concentrations of H2S or HCN above a few PPM ever been encountered in areas where the wasto is generated, stored, or otherwise handled?

Have any of the problems described above ever been encountered with disposal of this waste? (i.e. land disposal, treatment, etc.)

If you indicated a positive response to any of the above questions, please explain below:

Sincerely,

Joe Kash Regional Compliance Manager

(Generator's Signuture)

ENGINEER (Date)

1301 5'00X\00X

|                                                                                 |                                                                                                                                                                                               | Special                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Waste Pro                                                                                                   | eacceptan                                                                        | ce Fo                 | orm (P                                                                                                        | rofile Identification                                                                                                         | Sheets) | с.   |         |          |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------|------|---------|----------|
| Generator<br>This is a:<br>Process D<br>Generic N<br>Physical C<br>Paint filter | ame <u>Country</u><br>ddress <u>31725 N</u><br>Name: <u>Forman</u><br>Address: <u>Parshir</u><br>warker<br>tor ID No: <u>09 1 C</u><br>SIC Code:<br>Pollution Control Warker<br>ame: <u>M</u> | side Li<br>Rt 83<br>No-th<br>Po-th<br>Side La<br>Po-th<br>Side La<br>Side L | Andfill<br>Plant h<br>Daba<br>Daba<br>Coss<br>Jos<br>Justrial Process<br>(kare<br>tigetics an<br>or trained | Ke<br>AlaP Siar<br>Singer Ba<br>Waste as define<br>Waste as define<br>din terior | ad in Sc<br>x for whi | Facility<br>Genera<br>Genera<br>Iff diff<br>Phone<br>Trans<br>Trans<br>Trans<br>trion 3 of 1<br>ch subpib has | ID No 0970250003<br>tor Contact Person AL<br>tor Mailing Address:<br>erent)<br>Number: (312), 240<br>porter:<br>porter Phone: | - 4832  |      |         |          |
| Waste Pha                                                                       |                                                                                                                                                                                               | ild.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | •                                                                                                           |                                                                                  | •                     |                                                                                                               | Flash Point F: 720                                                                                                            |         |      |         | -        |
|                                                                                 | cidity/Alkalinity N                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ·····                                                                                                       |                                                                                  |                       |                                                                                                               | pH (for aqueous wastes o                                                                                                      |         | 5    |         | _        |
| <b></b>                                                                         | ·                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | · · · · · · · · · · · · · · · · · · ·                                                                       |                                                                                  |                       |                                                                                                               | · · · · · · · · · · · · · · · · · · ·                                                                                         |         |      |         | 1        |
| J                                                                               |                                                                                                                                                                                               | ppm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b></b>                                                                                                     | ·                                                                                |                       |                                                                                                               |                                                                                                                               | ppm     |      | •<br>•  | {        |
|                                                                                 | Constituant                                                                                                                                                                                   | Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | PQL                                                                                                         | Result                                                                           | ł                     |                                                                                                               | Constituant                                                                                                                   | Limit   | PQL  | Result  | 1        |
| D004                                                                            | Arsenic                                                                                                                                                                                       | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 20.10                                                                            |                       | D026                                                                                                          | Cresol                                                                                                                        | 200.0   |      | ļ       | Į        |
| D005                                                                            | Barium                                                                                                                                                                                        | 100.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                             | ×1.0                                                                             | { ·                   | D027                                                                                                          | 1. 4-Dichlorobenzene                                                                                                          | 7.5     |      | < 0. 10 | 1        |
| D006                                                                            | Cadmium                                                                                                                                                                                       | 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | <0.050                                                                           |                       | D028                                                                                                          | 1, 2-Dichloroethane                                                                                                           | 0.5     |      | 120.10  | ł        |
| D007                                                                            | Chromium                                                                                                                                                                                      | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <u> </u>                                                                                                    | 40.050                                                                           |                       | D029                                                                                                          | 1, 1-Dichloroeshylene                                                                                                         | 0.7     |      | 20110   | 1        |
| D008                                                                            | Lead                                                                                                                                                                                          | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | · · · · · · · · · · · · · · · · · · ·                                                                       | <0.050                                                                           |                       | D030                                                                                                          | 2, 4-Dinitrotoluene                                                                                                           | 0.13    |      | <0.10   | ]        |
| D009                                                                            | Mercury                                                                                                                                                                                       | 0.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 10.0020                                                                          | ļ                     | D031                                                                                                          | . Heptachlor (& epoxide)                                                                                                      | 0.008   |      | ×0.0050 | ł        |
| D010                                                                            | Setenium                                                                                                                                                                                      | 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 20110                                                                            |                       | D032                                                                                                          | Hexachlorobenzene                                                                                                             | 0.13    |      | 20.10   | 1        |
| D011                                                                            | Silver                                                                                                                                                                                        | 5.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 40.050                                                                           | [                     | 0033                                                                                                          | Hexachioroburadiene                                                                                                           | 0.5     |      | 10.10   | 1        |
| D012                                                                            | Endrin                                                                                                                                                                                        | 0.02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                             | 40.00500                                                                         |                       | D034                                                                                                          | Hexachloroethane                                                                                                              | 3.0     | [    | <0.10   | 1        |
| D013                                                                            | Lindane                                                                                                                                                                                       | 0.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | < 0.0025                                                                         |                       | D035                                                                                                          | Methyl ethyl ketone                                                                                                           | 200.0   |      | 2010    | <b> </b> |
| D014                                                                            | Methoxychlor                                                                                                                                                                                  | 10.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                             | <0.025                                                                           |                       | D036                                                                                                          | Nitrobenzene                                                                                                                  | 2,0     |      | 20.10   | 1        |
| D015                                                                            | Toxaphene                                                                                                                                                                                     | 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 20.050                                                                           |                       | D037                                                                                                          | Pentachlorophenol                                                                                                             | 100.0   |      | 20.50   | ľ        |
| D016                                                                            | 2,4D                                                                                                                                                                                          | 10.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | ×01:0                                                                            |                       | D038.                                                                                                         | Pyridine                                                                                                                      | 5.0     |      | 20.20   | ]        |
| D017                                                                            | 2. 4. 5 TP Silver                                                                                                                                                                             | 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | <0.010                                                                           |                       | D039                                                                                                          | Tetracholorethylene                                                                                                           | 0.7     |      | 20.10   |          |
| D018                                                                            | Benzene                                                                                                                                                                                       | 0.50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                             | 20110                                                                            | · ·                   | D040                                                                                                          | Trichloroethylenc                                                                                                             | 0.5     |      | 40,10   |          |
| D019                                                                            | Carbon Tetrachloride                                                                                                                                                                          | 0,5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 40.10                                                                            |                       | D041                                                                                                          | 2.4.5-Trichlorophenol                                                                                                         | 400.0   |      | 40.50   |          |
| D020                                                                            | Chlordane                                                                                                                                                                                     | 0.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                             | 20.010                                                                           |                       | D042                                                                                                          | 2, 4, 6-Trichlorophenol                                                                                                       | 2.0     |      | 40.10   |          |
| D021                                                                            | Chlorobenzene                                                                                                                                                                                 | 100.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                             | 20110                                                                            | ſ                     | D043                                                                                                          | Vinyl Chloride                                                                                                                | 0.2     |      | 20.10   | ]        |
| D022                                                                            | Chloroform                                                                                                                                                                                    | 6.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                             | 20.10                                                                            |                       |                                                                                                               | Reactive Sulfide                                                                                                              | 500.    |      | 4230    | *5.      |
| D023                                                                            | o-Cresol                                                                                                                                                                                      | 200.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                             | < 0.10                                                                           | }                     |                                                                                                               | Reactive Cyanide                                                                                                              | 250.    | 0,32 | 1.6     | ]        |
| D024                                                                            | m-Cresol                                                                                                                                                                                      | 200.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                             | £0.10                                                                            |                       |                                                                                                               | Phenols                                                                                                                       | 1000.   | 0.29 | 2.0     | ]        |
| 0025                                                                            | p-Cresol                                                                                                                                                                                      | 200.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | }                                                                                                           | 2010                                                                             | 1                     |                                                                                                               | EOX                                                                                                                           | 10,000  |      | 1       | ]        |
|                                                                                 |                                                                                                                                                                                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                             | 1                                                                                | 1                     | 1                                                                                                             | PCBs                                                                                                                          | 50.     | I    | 40.15   | 1        |

The above analysis has been conducted in accordance with SW-846 Test-Methods for Evaluation of Solid Waste. I have reviewed the analysis and the attached certification form (if applicable) and determined that the waste will be: ______ accepted ______ rejected in accordance with the terms of our facility operating permit. In addition, I agree to require the generator to recertify annually that this waste has not changed sine the preacceptance analysis was conducted.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that i qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directl responsible for gathering the information, the information submitted is true, accurate and complete. I am aware that there are significant penalties for knowingly submitted take information, including the possibility of fine and imprisonment.

| signature Der Kal         | Date: 09-06-02 |
|---------------------------|----------------|
| Printed Name: Joseph Kash | Title: JWAP    |
| prevides                  | <u></u>        |

# APPENDIX F

# HEALTH AND SAFETY PLAN



Natural Resource Technology

### SITE-SPECIFIC HEALTH AND SAFETY PLAN

## FORMER MANUFACTURED GAS PLANT SITE NORTH SHORE GAS COMPANY NORTH PLANT SITE 849 PERSHING ROAD WAUKEGAN, ILLINOIS

Project No: 2088

Prepared by: Natural Resource Technology, Inc. 23713 W. Paul Road, Suite D Pewaukee, WI 53072

July 26, 2012

Andrew Millspaugh Environmental Engineer Glenn Luke Environmental Engineer

#### NATURAL RESOURCE TECHNOLOGY

#### SECTION A HEALTH AND SAFETY PLAN SUMMARY

A copy of this Health and Safety Plan (HASP) will be maintained on site during field activities and updated as deemed necessary by the Project Manager.

#### SITE INFORMATION

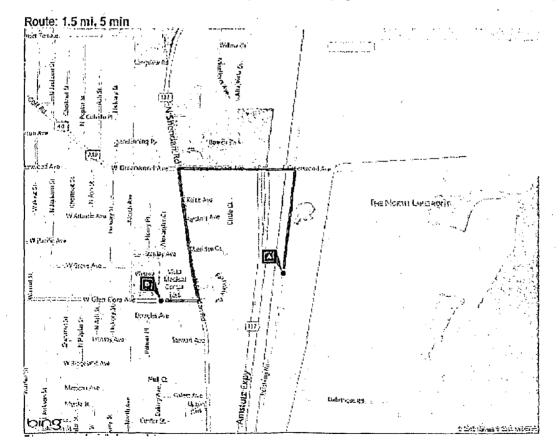
| Site Address:          | 849 Pershing Road                 |
|------------------------|-----------------------------------|
| Municipality / County: | Waukegan, II / Lake County        |
| Major Cross Roads      | SE of W Greenwood Ave and HWY 137 |
| and/or Geographic      | ~0.5 mile West of Lake Michigan   |
| Features:              |                                   |

#### HOSPITAL INFORMATION

#### Route to Hospital Map, detailed description on next page

|   | Hospital Name:   | Vista Medical Center – East |
|---|------------------|-----------------------------|
| 1 | Hospital Address | 1324 North Sheridan Road    |
|   |                  | Waukegan, II 60085          |

#### Route to Hospital Map, detailed description on next page



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## HOSPITAL ROUTE DESCRIPTION

|    | Description                                                 |
|----|-------------------------------------------------------------|
| 1. | Start at 849 Pershing Road going NORTH toward Greenwood Ave |
| 2. | Turn LEFT on Greenwood Ave                                  |
| 3. | Turn LEFT on North Sheridan Road                            |
| 4  | Arrive at 1324 North Sheridan Road                          |
| 5. | Turn RIGHT on Gien Flora Ave for Emergency Room Entrance    |

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| <u> </u>         | Agency Name and Address (if applicable)                                              | Contact Number(s)                            |
|------------------|--------------------------------------------------------------------------------------|----------------------------------------------|
| Fire Dept:       | Waukegan Fire Department                                                             | 911 / 847.249.5410                           |
| Police:          | Waukegan Police Department                                                           | 911 / 847.360.9000                           |
| Sheriff:         | Lake County Sheriff's Department                                                     | 911/847.377.4000                             |
| Local Utilities: | JULIE Illinois One-Call System                                                       | 811/800.892.0123                             |
| NRT PM:          | Glenn R. Luke                                                                        | 262.523.9000 office<br>262.719.4513 cellular |
| Ambulance        | 911                                                                                  | 911                                          |
| Hospital:        | Vista Medical Center – East<br>1324 North Sheridan Road<br>Waukegan, Illinois, 60085 | 911 Emergency<br>General (847.360.3000)      |

#### EMERGENCY CONTACT LIST

#### **Description of Site:**

The North Plant Site is a former manufactured gas plant covering approximately 21 acres and comprises four parcels. The site is bound to the north by Dahringer Road, to the west by Pershing Road, to the east by property owned by the EJ&E Railroad, and to the south by property owned by A.L. Hasen Manufacturing Company. Two parcels covering approximately 16 acres are currently vacant and undeveloped. The remaining area is owned by EJ&E Railroad and Includes the remainder of the Waukegan Tar Pit.

#### Activities:

Surface material at the site will be removed through excavation for landfill disposal. Subsurface source material at the site will be remediated through in situ solidification/stabilization. Material is expected to contain contamination related to the former MGP facility and typical of a developed industrial area. Excavation and ISS will be performed by a qualified contractor. NRT will perform oversight activities and will collect and process soil, air, and wastewater samples. NRT will not operate any excavation equipment. Specific activities anticipated for NRT include the following:

#### Air Monitoring:

- Operation and collection of samples from SUMMA canisters
- Operation of portable aerosol monitoring equipment
- Operation and maintenance of photoionization detector Soil Sampling:
- son samping:
  - Collection, processing, and shipping of samples for laboratory analysis
- Preserving soil samples with ice and/or methanol

Wastewater Disposal Sampling:

- Collection, processing, and shipping of samples for laboratory analysis
- Preservation of water samples with ice, hydrochloric acid, nitric acid, sulfuric acid, and/or sodium hydroxide

#### HEALTH AND SAFETY MONITORTING AND LABORATORY AND FIELD ANALYSIS:

Air monitoring will be performed for VOCs and particulates.

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NATURAL RESOURCE TECHNOLOGY

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# EQUIPMENT, PRESERVATIVES, CALIBRATION MATERIAL, DECONTAMINATION CHEMICALS:

MSDS for listed materials are in Appendix A

- Air Monitoring Equipment with lithium ion battery
- Field Chemicals including bug repellent spray or cream (e.g., Off) and sun screen
- First Aid Kit including eye wash sterile solution, rapid aid instant cold pack, PVP iodine scrub solution, burn spray, hydrocortisone cream 1%, neomycin antibiotic ointment, antiseptic spray
- Equipment decontamination with Alconox

#### Health/Safety Hazards on Site:

| Chemical / Material                              | Media      | Maximum<br>Concentration | Routes of Exposure                       |
|--------------------------------------------------|------------|--------------------------|------------------------------------------|
| Volatile Organic<br>Compounds                    | Soil/Water | High, Potential for tar  | Inhalation, ingestion, skin/eye contact. |
| Semi-Volatile Organic<br>Compounds               | Soil/Water | High, Potential for tar  | Inhalation, ingestion, skin/eye contact. |
| Metals (arsenic, copper,<br>lead, mercury, zinc) | Soil       | Low                      | Inhalation, ingestion, skin/eye contact  |

The safety coordinator/emergency coordinator will be the NRT staff personnel supervising the field investigation/work.

#### Protective Equipment/Instruments:

In general, personal protective equipment (PPE) will be used as specified on Table 1 for the anticipated project tasks. The health and safety manager and/or the project manager may require additional PPE based on field conditions or additional data collection.

#### Safety Equipment:

Fire extinguishers and first aid kits in field vehicles and field office.

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#### DISTRACTED DRIVING ACTIVITY PROHIBITIONS

Illinois bans the use of handheld cell phones while driving in school zones or highway construction zones. NRT prohibits all driving distraction activities, including eating, grooming, reading, text messaging, taking notes, internet access, and media viewing related activities when driving NRT owned or rented vehicles, whether driving for business or personal reasons.

NRT prohibits all driving distraction activities; including eating, grooming, reading, text messaging, taking notes, internet access, and media viewing related activities when driving NRT owned or rented vehicles, whether driving for business or personal reasons.

The use of cellular phones for conversation should be reserved as a non-driving activity or limited with the following guidelines:

- The first priority during cell phone use is safe driving. Never allow a phone conversation to distract you from concentrating on driving.
- Always follow restrictions and bans for the state and municipality you're traveling in; the following link has a summary of State laws http://www.ghsa.org/html/stateinfo/laws/cellphone_laws.html.
- If it's unsafe for you to answer a call, let your voice-mail pick it up.
- Use a headset while driving, or pull over to use a handheld phone. NRT will provide a hands-free accessory of NRT's choosing, for your cell phone if the accessory did not come with your cell phone.
- Keep conversations short and suspend the call in serious circumstances (e.g., heavy traffic, stopand-go traffic, maneuvering around hazards, severe weather conditions).
- Avoid placing calls while moving; use speed dialing when making calls and strive to plan calls before driving is started. When dialing manually without the speed-dialing feature, dial only when the vehicle is stationary.
- When receiving a call, inform the caller that you are driving and will suspend/end the call without notice if traffic conditions become hazardous in any way. If possible, ask a passenger to make the call for you or at least dial the number for you.
- If you're talking while driving, keep your head up, your eyes on the road, and frequently check the side and rearview mirrors.
- To obtain roadside assistance or report emergencies, use 911 and give exact location, nature of emergency, name, and number.

Reporting

Report all cell phone near-misses and accidents on the NRT Accident/Near-Miss Reporting Form included in Appendix B.

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### NATURAL RESOURCE TECHNOLOGY HEALTH AND SAFETY PLAN SUMMARY

## Table 1. Summary of PPE By Sampling Activities

| PPE Required                      | Site Reconnaissance/Field<br>Mobilization | ISS Field Oversight | Soil Sampling (heavy<br>equipment or drill rig) | Soil Sampling (hand augers<br>or shovels) | Test Pit<br>Excavation/Trenching | Subsurface structure<br>inspection (from surface) |
|-----------------------------------|-------------------------------------------|---------------------|-------------------------------------------------|-------------------------------------------|----------------------------------|---------------------------------------------------|
| Steel-Toed Boots<br>(Rubber)      |                                           | Av                  | Av                                              | Av                                        | Av                               | Av                                                |
| Steel-Toed Boots<br>(Leather)     | х                                         | Х                   | Х                                               | х                                         | х                                | · X                                               |
| Hard Hat                          |                                           | X                   | X                                               |                                           | Х                                | Х                                                 |
| Safety Glasses/Goggles            | X                                         | Х                   | X                                               | Х                                         | Х                                | X                                                 |
| Gloves-Inner (Nitrile)            | Av                                        | AV                  | Х                                               | Х                                         | X                                | Av .                                              |
| Gloves-Outer (Nitrile)            |                                           |                     | X                                               |                                           | Х                                |                                                   |
| High Visibility Vest              | X                                         | X                   | Х                                               | X                                         | Х                                | Х                                                 |
| Tyvek Coverall                    | •                                         |                     | Av                                              | Av                                        | Av                               |                                                   |
| Photoionization<br>Detector (PID) |                                           | Av                  | х                                               | X                                         | Av                               | Av .                                              |
| Hearing Protection                |                                           | Av                  | Av                                              |                                           | Av                               | Av                                                |

X = PPE Required

Av = Have available at work site

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#### NATURAL RESOURCE TECHNOLOGY HEALTH AND SAFETY PLAN SUMMARY

# FIELD HEALTH & SAFETY PLAN REVIEW I CERTIFY THAT I HAVE READ AND UNDERSTOOD ALL HEALTH AND SAFETY PROCEDURES WITHIN THIS HEALTH AND SAFETY PLAN: Name and Affiliation (printed) Signature Date

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| SILE-SPECI | FIC SAFETY ME                         |          | <u>يعلي ترف يسمد المثل المشتخ معتبد والمحمول والم</u> | <u></u>                               |
|------------|---------------------------------------|----------|-------------------------------------------------------|---------------------------------------|
| Lead       | Date                                  | Time     | Topic(s)                                              | Personnel                             |
|            |                                       |          |                                                       |                                       |
| , .        |                                       |          |                                                       |                                       |
|            |                                       |          |                                                       |                                       |
|            |                                       |          |                                                       |                                       |
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# SECTION B - HEALTH AND SAFETY PLAN

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# APPENDICES

Appendix A:Chemical Information and Material Safety Data Sheets (MSDS)Appendix B:Accident / Injury or Near Miss Report Form

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# **1 INTRODUCTION**

# 1.1 Purpose and Scope

This document describes the health and NRT safety procedures and requirements for field activities. This document is intended to serve as a Multi-Site Health and Safety Plan (HASP) to ensure that fieldwork performed by NRT is in compliance with applicable federal, state, and local occupational safety and health regulations. Subcontractors shall be made aware of the requirements of this plan; however, **subcontractors are required to have their own plan for the health and safety of their own employees** and for following all applicable federal, state, and local regulations.

In compliance with HAZWOPER, a comprehensive work plan will be developed for each site to evaluate the logistics and resources needed to reach work objectives for site operations. The work plan will identify key individuals and their responsibilities, site activities, methods for accomplishing objectives (sampling plans), and normal operating procedures. Site-specific work plan(s) will be available on location at the site.

# **1.2 Health and Safety Plan Modification Procedures**

Due to varying site conditions or encountering unanticipated hazards, it may be necessary to revise the health and safety plan. Necessary plan changes that call for more stringent procedures or a higher level of personal protective equipment (PPE) may be made at any time by the Health and Safety Manager (HSM), Project Manager (PM), or Task Leader in cooperation with the Project Health and Safety Officer (PHSO).

Plan changes that would make safety procedures or PPE requirements less stringent may be made only with approval of the HSM and PM. Plan changes must always be put in writing and communicated to all field personnel.

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SECTION B Health and Safety Plan Section 2-- Key Personnel/Identification of H&S Personnel Page 2 of 28

# 2 KEY PERSONNEL/IDENTIFICATION OF H&S PERSONNEL

## 2.1 Key Personnel

Responsibilities for health and safety compliance issues associated with hazardous waste operations are primarily vested in the project organization, with support from appropriate health and safety professionals on NRT's technical and administrative staffs.

# 2.2 Site-Specific Health and Safety Personnel and Organizational Responsibility

#### 2.2.1 Corporate Health and Safety Manager

The Corporate Health and Safety Manager (HSM) acts as a technical resource to all NRT offices on health and safety matters. This person is responsible for ensuring that all NRT health and safety programs comply with applicable federal, state, and local statutes for safety and health protection; executive orders; operating orders; permits and regulations; and company policies and procedures. The HSM is also responsible for review and approval of all site-specific Health and Safety Plans, serves in a consultation capacity to the technical staff on health and safety-related issues, and has the authority to conduct health and safety audits.

#### 2.2.2 Project Manager

The Project Manager (PM) is accountable for health and safety compliance on his or her projects. The PM is responsible for the technical and financial execution of the project, and has the authority to commit resources, adopt program policies and procedures, and approve expenditures and subcontracts. The PM will ensure that adequate resources are budgeted and available to implement the health and safety program and that appropriate technical resources are brought in to support the health and safety needs of the project. The PM will ensure that health and safety is a high priority in planning fieldwork and/or lab studies, and that adequate resources are available to develop and implement an appropriate project-specific health and safety plan.

### 2.2.3 Project Health and Safety Officer

The Project Health and Safety Officer (PHSO) is responsible for developing and implementing the projector Site-Specific Health and Safety Plan. In the event a PHSO has not been identified for a specific project, the PM will assume those responsibilities. The PM is ultimately responsible for health and safety for the project. It is the responsibility of the PM to report any unsafe conditions reported by project staff to the HSM and to work cooperatively to mitigate unsafe conditions. The PHSO will also ensure compliance with health and safety requirements presented in this Plan. The PM will serve as the PHSO unless sitespecific hazards are identified warranting assignment of a PHSO to the project. To meet these responsibilities, the PM/PHSO may:

- Act as a health and safety consultant to the project field staff
- Provide site-specific training to staff assigned to work at the site
- Review and confirm any changes in personal protective clothing or respiratory protection requirements
- Require the specific health and safety precautions be taken before personnel enter a site
- Restrict access to the site or a portion thereof
- Perform necessary personnel monitoring
- Stop work when the health or safety of project personnel are jeopardized and order the immediate evacuation of personnel from any area of the site
- Require personnel to obtain immediate medical attention if warranted
- Provide health and safety briefings to site visitors
- Enforce the requirements stated in the Corporate Health and Safety Manual and the project- or Site-Specific Health and Safety Plan

#### 2.2.4 Field Team Members

NRT personnel must know, understand, and comply with the requirements of this Plan developed for their projects. Field personnel will:

- Read and understand all applicable health and safety plans
- Perform work safely
- Be aware of and alert for signs and symptoms of work-related injuries and illnesses
- Promptly report any unsafe conditions that may occur on site to the PHSO, PM, and/or HSM

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#### 2.2.5 Subcontractors

Subcontractors have primary responsibility for the health and safety of their own employees. However, NRT is required by OSHA standards (e.g., 29 CFR 1910.120) to provide information to its subcontractors on known or potential workplace hazards, as well as the methods proposed to manage the identified hazards.

It is currently OSHA policy to issue citations to prime contractors in the event that their subcontractor is found to be out of compliance with regulatory requirements. NRT may incur civil penalties as a result of non-compliance with regulatory requirements by its subcontractors and/or injuries or illnesses incurred by the subcontractor's staff. Personal injury suits have been successfully brought against prime contractors in instances where a subcontractor's employee has demonstrated that the lack of health and safety oversight on the part of a prime contractor played a role in his or her sustaining an injury or illness.

NRT intends to manage its subcontractors to protect the health and well-being of NRT staff. NRT's objective is to manage subcontractors in a way that limits NRT's and our client's liabilities related to subcontractor performance, including management of health and safety issues. To achieve this objective, a minimum level of subcontractor surveillance, with respect to health and safety issues is required.

When required by NRT, the subcontractor must review project-specific health and safety information and hazards, and develop and implement a health and safety plan. This plan must comply with all applicable health and safety regulations and any project-specific requirements that NRT has specified. The subcontractor must provide NRT with a copy of this plan before the start of work. NRT acceptance of the subcontractor's plan does not mean that NRT concurs with the adequacy of the plan for protection of the health and safety of the subcontractor's employees. That responsibility rests solely with the subcontractor. NRT's review of subcontractor health and safety plans will be for the purposes of: 1) assessing potential health and safety impacts to NRT personnel and 2) meeting NRT legal responsibilities as a prime contractor. Any deficiencies in the subcontractor's plan or inconsistencies in proposed work practices between NRT and its subcontractor should be identified. If appropriate, these deficiencies or differences should be resolved before the work begins.

## 2.3 Communication

Field staff and subcontractors are both permitted to call 911 in an emergency situation. As part of preparing the Site-Specific Health and Safety Plan, 911 services will be verified for each site location. Assuming the PM is not on site, field staff should contact the PM as soon as possible regarding the on-site situation. It is then up to the discretion of the PM to contact the Client.

SECTION B Health and Safety Plan Section 3– Task/Operation Safety and Health Risk Analysis Page 5 of 28

# 3 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

# 3.1 Historical Overview of Site

A historical overview of the site along with details of the project description is provided in the project Work Plan. Specific protocols for sampling, sample handling and storage, chain-of-custody, and laboratory and field analyses to be performed are described in NRT's SOPs. Quality assurance/quality control (QA/QC) procedures are structured in accordance with applicable technical standards, regulations, and guidance.

### 3.2 Risk Analysis-General

Personnel in the vicinity of the drilling, excavation, and sampling operations are not only subject to the hazards of direct exposure to contaminants, but also to dangers posed by machinery operation. In addition, stresses due to working in protective clothing may be encountered. Physical, chemical, and biological hazards are present to some degree at most job sites.

### 3.2.1 Heat/Cold Stress

Temperature extremes, wet working conditions, and PPE can all combine to cause injury and illness to field workers. In general, high temperatures and/or impermeable PPE can induce heat stress. Cold stress can be induced by low temperatures and/or wet skin or clothing.

#### PRECAUTIONS

Heat Stress: Wear thin cotton clothing under Tyvek[™] suits; have thirst liquids available; try to schedule work during cooler parts of the day (early morning or evening), take frequent breaks, and, stop work and move to a cool location if heat exhaustion occurs (e.g., light headedness, profuse sweating).

**Cold Stress:** Dress in layers and regulate clothing to activity levels; wear plenty of layered clothing (so layers can be added or removed); cover exposed skin especially if it is windy; use glove liners which can keep hands warm but reduce dexterity; use face masks and helmet liners to keep head warm and, take frequent breaks to warm up or stop work if conditions get too cold.

#### SYMPTOMS

Heat Stress: Profuse sweating, weakness, rapid pulse, dizziness, nausea, and headache.

Heat Stroke: high temperature, hot, dry skin, nausea, vomiting, fatigue, dizziness, muscle cramps, and flushed appearance.

**Cold Stress**: Involuntary shivering, speech difficulty, loss of manual dexterity, and memory lapse. The most severe localized form of cold stress, frostbite, causes the skin to become numb, pale, hard, and cold.

#### FIRST AID MEASURES

Heat Stress: Move the person to a shaded, cool area. Have them drink large quantities of fluids.

Heat Stroke: Seek medical attention immediately; cool the person as quickly as possible

**Cold Stress**: Move the person to a heated, sheltered area. Immerse exposed body parts in warm (104-130 °F) water. If exposed skin is numb, do not rub it. If frostbite is suspected, seek medical attention as soon as possible.

### 3.2.2 Slips, Trips, and Falls

The most common hazards that will be encountered on a jobsite will be slips, trips, and falls. Common sense will be used to avoid these hazards. When working on slippery surfaces, tasks will be planned to decrease the risk of slipping. Slippery surfaces will be avoided, work and travel will not be hurried, and good housekeeping will be maintained. It is not advisable to walk and talk on a cell phone at a job site, if possible. It is also not advisable to text while walking on a job site. Personnel must vigilantly observe where they are working and walking to avoid slips, trips, and falls.

### 3.2.3 Vehicular Traffic

Another common hazard that will be encountered at many sites will be vehicle traffic, including cars, trucks, drilling rigs and heavy machinery. When it is necessary to move a vehicle, site drivers must be mindful that pedestrians are present on site. If appropriate, site personnel on foot may guide site drivers while moving vehicles to alert and protect non-site personnel. Site personnel on foot must avoid standing in blind spots or in high traffic areas, be aware of vehicle locations, and make eye contact with site drivers if crossing the path of vehicles is necessary. Site personnel on foot must vigilantly observe where they are working and walking to avoid being struck by vehicles which, for one reason or another, are moving. Finally, when working in high traffic areas (e.g., on the edge or in the middle of city streets, heavily used

parking areas) site personnel are required to set up traffic cones and wear orange traffic safety vests to alert drivers to their presence.

Work performed in rail yards or along railroad tracks poses an additional hazard. Numerous incidents have occurred when working between or alongside rail lines and have resulted in serious injury or death. Therefore, the following rules must be followed when working near rail lines:

- Never walk or step on a railroad track; tracks can be slick and injury due to slipping off a track is possible
- Never run over tracks Always Walk; tripping injuries can occur when running over the tracks which can result in serious head injuries
- Never stand between the tracks; when necessary, walk across the railroad tracks and stand to one side or the other of a rail line
- Always wear a hard hat, eye protection, steel-toed boots, and an orange reflective vest for personal protection

In addition to these rules, whenever work is done near railroad tracks or in a railroad right-of-way, the railroad company must be contacted and a flagman requested to monitor work activities. No work will be done without a railroad flagman being present unless the railroad company expressly permits it.

### 3.2.4 Hunting Season

It is possible field activities will be conducted during hunting seasons and may pose a risk to site workers. The hunting season dates will be reviewed prior to conducting field activities in non-urban areas. During hunting season, site workers will wear a minimum of at least 50% of the outer clothing above the waist in 100% blaze orange (faded blaze orange is not acceptable) to alert potential hunters to their presence. If site work is performed in densely vegetated locations, site personnel may post signs along access locations to indicate their presence.

#### 3.2.5 Exposure to Excessive Noise

Overexposure to noise can result in hearing loss. If it is difficult to hear normal speech when the speaker is 3 to 4 feet from the listener, and that condition is present for more than four hours a day, it will be assumed that the noise level exceeds 85 decibels (dBA) and appropriate hearing protection will be used. The disposable "ear plug" type hearing protectors are recommended.

### 3.2.6 Chemical Hazards

PPE requirements are stated in Personnel Protection Section 5 of this Plan. Material Safety Data Sheets for suspected contaminants present at a site are contained in Appendix A.

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### 3.2.7 Biological Hazards

During warm weather months, potential biological hazards include venomous insects, snakes, and poisonous plants. Appropriate safety measures, such as the use of insect repellent (with DEET) and probing of possible nesting areas, will be taken to prevent exposure to biological hazards.

Ticks are common in wooded and heavily vegetated areas in spring, summer, and fall in the Midwest. The deer tick, also known as a bear tick or a blacklegged tick, is much smaller than the wood tick. Adults are about 1/8 inch long and reddish-brown in color. They live in the woods and are common along trails. Deer ticks crawl, rather than jump, so are most likely to come into contact with humans as they brush against low-lying vegetation.

Wood ticks are a type of hard tick. Male wood ticks have mottled gray backs. Females have gray coloration behind their heads. They are found in both grassy and wooded areas. Both wood ticks and deer ticks can occasionally cause illness in their hosts. The deer tick can sometimes carry Lyme disease, a serious illness which can cause a rash, fever, tiredness, and flu-like symptoms. Wood ticks can carry Rocky Mountain spotted fever, a rare but sometimes serious illness that causes a rash and severe flu-like symptoms. At the end of the day personnel should do a self-inspection for ticks to remove them. Pulling them off with tweezers works the best. Grab the tick as close to the skin as possible and pull upward with a slow steady pressure. Try not to leave the head or any mouth parts of a tick imbedded in the skin as it can transmit diseases.

Poison ivy, poison oak, and poison sumac release oil (urushiol) when the leaf or other plant parts are bruised, damaged, or burned. When the oil gets on the skin an allergic reaction, referred to as contact dermatitis, occurs in most exposed people as an itchy red rash with bumps or blisters. When exposed to 50 micrograms of urushiol, an amount that is less than one grain of table salt, 80 to 90 percent of adults will develop a rash. The rash, depending upon where it occurs and how broadly it is spread, may significantly impede or prevent a person from working. Although over-the-counter topical medications may relieve symptoms for most people, immediate medical attention may be required for severe reactions. Long sleeves and pants will provide protection from contact with poisonous plants and insects. Field personnel should familiarize themselves with poison ivy, poison oak, and poison sumac. Care should be taken to avoid contact with poisonous plants.

### 3.2.8 Thunderstorms and Rain

Drilling/excavation and sampling activities during electrical storms poses a hazard of electrocution by a lightning strike, and adverse working conditions, as well as high winds tipping the drill rig. Drilling/ excavation and sampling activities will stop and the drilling rig mast will be lowered at the

approach of a thunderstorm. Drilling activities during rainstorms can cause not only slippery conditions but also excess friction on cathead pulleys. This can cause dangerous conditions during drive sampling operations. Therefore, drive sampling operations will cease and, depending on the PHSO's assessment, drilling may be halted.

When drilling or using excavating equipment, if lightning is seen or thunder is heard, regardless of the distance, all drilling and excavation operations must be temporarily shut down. If possible, the mast on the rig should be lowered and connection with the drill pipe in the ground broken. Operations may not resume until all threat from lightning is over, which is at least 30 minutes after the last observed lightning or thunder. Lighting strikes are possible up to 10-miles from an obvious storm front. It is recommended to check local radar images to determine if other storms are following the one that shut operations down before resuming drilling.

# 3.3 Risk Analysis-Task-by-Task

|                                                             | Hazards  |            |           |                |          |      |         |       |                    |                 |                       |                |       |                   |
|-------------------------------------------------------------|----------|------------|-----------|----------------|----------|------|---------|-------|--------------------|-----------------|-----------------------|----------------|-------|-------------------|
|                                                             |          |            |           |                | Physical |      |         |       |                    |                 |                       |                |       |                   |
|                                                             | Chemical | Biological | Explosive | General Safety | Heat     | Cold | Traffic | Noise | Slip, Trips, Falls | Heavy Equipment | Underground utilities | Overhead Power | Lines | Trench/Excavation |
| Site reconnaissance/field mobilization                      | Х        | X          | X         | Х              | X        | Х    | X       | X     | X                  | X               | X                     |                | Х     |                   |
| Well and borehole drilling                                  | Х        | X          | Х         | Х              | Х        | X    | X       | X     | Х                  | Х               | Х                     | X              | Х     |                   |
| Monitoring well development                                 | Х        | X          |           | Х              | X        | X    | X       | [     | X                  |                 |                       |                | [     |                   |
| Groundwater level measurements                              | Х        | X          |           | X              | X        | X    | X       |       | X                  |                 |                       |                | 1     |                   |
| Groundwater and soil sampling                               | X        | X          |           | Х              | X        | X    | X       |       | X                  |                 |                       |                |       | X                 |
| Test pits and excavation                                    | Х        | X          | X         | X              | X        | X    | X       | X     | x                  | X               | X                     | X              | X     | X                 |
| Surface water sampling                                      | Х        | X.         |           | Х              | X        | X    | X       | X     | X                  | Х               |                       |                | X     |                   |
| Sampling solid material, wipe<br>sampling, surface sampling | Х        | X          |           | Х              | X        | X    | X       | X     | X                  | X               | Х                     | X              | X     |                   |
| Sampling through ice                                        | X        | X          |           | Х              |          | Х    | X       | X     | X                  | X               |                       |                | X     |                   |

Table 1. Anticipated Task Hazards

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### 3.3.1 Well and Borehole Drilling

In addition to the possibility of contact with the above listed chemicals, physical hazards associated with well and borehole drilling includes:

- Snapping cables
- Brush and equipment fires
- Being hit by equipment
- Being caught in rotating tools
- Falling objects
- Exposure to excessive noise
- Contact with energized electrical lines

### 3.3.2 Air Rotary Drilling

This type of drilling, in addition to the above listed hazards, may also expose field personnel to blowing dust and high-pressure airlines.

### 3.3.3 Groundwater, Seep, Soil, and Pipe Sampling

Collection of these samples presents inhalation and, direct skin contact hazards with the substances listed in Appendix A.

### 3.3.4 Drilling/Excavation near Overhead Electrical Lines

Drilling or excavation activities near overhead electrical lines present a serious electrocution hazard. Safe work distance must be maintained. This distance is a function of the humidity and the voltage present. Should work in the proximity of overhead lines be required, the minimum clearance will be determined based on OSHA standards as follows:

- Lines rated 50kV or below minimum clearance between the lines and any part of the crane or load shall be 10 feet. (1926.550(a)(15)(i))
- Lines rated over 50 kV minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet (CFR 1926.550(a)(15)(ii)).

Safe working distances are as follows:

Power line 51,000 to 138,000 volts - work at least 11 feet away

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- Power line more than 230,000 volts work at least 13 feet away
- Power line ≥500,000 volts work at least 18 feet away

Note that humid or wet conditions (rain) are conducive to potential arcing from power lines to the piece of equipment. It is not advisable to work near power lines during humid or wet conditions.

### 3.3.5 Drilling/Excavation near Underground Electrical/Utility Lines

Buried electrical/utility lines present a hidden danger while drilling/excavating. The subcontractor will be responsible for contacting the local underground utility locator service (call 811 nationally for state one-call system); however, it is the responsibility of the NRT PM or PHSO to ensure that the subcontractor has contacted the appropriate locator service to ensure that site activities can be completed in accordance with the schedule. The locator service will mark underground lines to ensure safe working conditions. Drilling/excavation will not occur until the site is properly marked. Drilling/excavation will not occur within three feet of any marked utility.

### 3.3.6 Test Pits and Excavation

Test pits and excavations pose a serious threat of injury resulting from falls or excavation wall collapses. During excavation or digging activities an exclusion work zone will be established around excavating machinery. Bystanders and on-lockers will be prohibited from entering this work zone while the excavating machinery is in operation. The work zone will be large enough so that the excavating machinery (e.g., trackhoe) can rotate 360-degree without extending out of the work zone. After the excavation is completed it should either be backfilled immediately or the entire excavation will be encircled with a physical barrier (e.g., barricades, orange excavation fencing), which will limit access to the excavation and decrease the likelihood of injury resulting from falls. Any excavation greater than four feet deep will not be entered unless the walls of the excavation have been reinforced to prevent wall collapse. Entry into any excavation greater than four feet deep will constitute a confined space entry procedure. Therefore, no excavation entrance is allowed.

A photoionization detector (PID) may be used to monitor air quality in the breathing zone of the work area for volatile organic compound (VOC) vapor levels and in an excavation (See Section 7 of this plan) if VOCs are anticipated to be present. Prior to Contractor Personnel entering any excavations to install piping or any other equipment, at a minimum the PID will be lowered into the excavation to determine air quality in the excavation. Depending on the potential hazards present additional air monitoring may include, oxygen levels, lower explosives limit, sulfide, carbon monoxide, and cyanide. Confined spaces will not be entered.

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### 3.3.7 Operations on Surface Waters

The procedures specified in this subsection are designed to protect NRT staff when conducting work activities involving water craft vessels on surface waters. Governmental laws and regulations regarding onshore waters are under the jurisdiction of the Unites States Coast Guard (USCG) and the state regulatory agency and its regulations will be adhered to. Always Work In Pairs – Never Conduct Work Activities Alone.

#### 3.3.7.1 Scope and Applicability

The procedures specified in this subsection apply to all work activities involving surface waters (including sediment sampling). The highest ranking NRT staff member (e.g., Project Manager, Field Task Leader) at the work site is responsible for implementing this plan. The work activities will not be initiated prior to receiving approval from the PM.

- Work activities can be conducted in "open water" or "ice" conditions
- Each NRT staff person at the site is responsible for following these procedures

#### 3.3.7.2 Water Craft

The following procedures will be observed when NRT staff conducts work activities in "open water" conditions in a water craft vessels (including drill rigs mounted on barges):

- Work will not be initiated prior to meeting approval from the PM
- Work activities conducted on surface waters will be conducted in accordance with the requirements of the USCG and the appropriate state agency
- Personal Flotation Devices (PFD) that is USCG approved must be worn at all times when on surface waters. The PFD must be properly securely fastened. One adult size PFD (wearable style) for every person on the water craft is required
- A minimum of two PFDs must be on board on the water craft at all times
- A minimum of one "throwable" flotation device w/attached line must be on board
- Distribute weight evenly across the beam of the watercraft
- Only allow one person to stand at a time in a small watercraft vessel
- Do not exceed manufacture's capacity plate load limits

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SECTION B Health and Safety Plan Section 3– Task/Operation Safety and Health Risk Analysis Page 13 of 28

- Attach a lanyard or safety line which can be tied to the sampling personnel when water surface conditions are rough. This will enable easier retrieval of the person should he/she fall over the side of the water craft
- Check running condition of the outboard motor prior to launching (e.g., ample supply of fuel/oil mix, fuel line condition, integrity of the propeller, EXTRA SHEER PINS for the propeller)
- Equipment to have on board include oars, anchor w/line (100 foot minimum line on inland waters) and mooring lines of adequate length
- Wear work gloves when using equipment that could injure hands
- Wear hard hat if overhead hazards exist (e.g., A-Frame, use of long coring devices)
- Secure overboard equipment to vessel
- Use proper lifting techniques when retrieving heavy equipment

#### 3.3.7.3 Shallow Water

Site-Specific Work Plan and the site reconnaissance will evaluate the best approach to sampling in shallow water. If wading is necessary, work activities in shallow water along the shore line shall consider the following hazards:

- Use waders to minimize exposure to water, sediment contaminant exposure and heat loss
- Proceed carefully water currents and falling can cause the waders to fill creating a very serious condition. In addition to wearing a PFD, a safety line should be tethered to the person walking in water currents
- Fatigue can occur more rapidly from walking through the water

#### 3.3.7.4 Sampling Through Ice

Collection of samples through frozen rivers/lakes presents the difficulties of working on ice. Precautions for slips, trips, and falls will be observed. Ice thickness will be at a minimum of 9-inches thick before work activities will commence.

The following procedures will be observed when NRT staff conducts work activities on "ice" conditions:

- Work activities will not be initiated prior to meeting approval from the Environmental Health & Safety Manager (EHSM)
- Know the ice (e.g., thickness) and proceed with extreme caution. Ice thickness at a minimum should be 18 to 24 inches (when conducting drilling operations) and inspected for integrity. Check ice thickness regularly when traversing across ice to assure adequate support exists. Be especially cautious when approaching pressure cracks, areas of open water or areas of rivers where water velocity may be higher

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- Wear PFDs at all times
- Warm weather causes ice thinning and potential for slipping (drilling holes on thinning ice can cause flooding of ice surface and can accelerate ice thinning and breakage)
- Equipment may be required to be hauled between work stations (use sleds)
- Fatigue can occur from walking and drilling holes

Based on water currents, water temperature and the amount of clothing worn by NRT staff, the threat of being swept downstream or drowning is possible. Extreme caution must be used when conducting these types of work activities. If a NRT staff employee should fall into the water, the employee will be retrieved and all warranted precautions shall be taken to ensure the safety and well being of that individual. Work activities will be immediately suspended and the person brought to shore. Wet clothing shall be removed and the person shall be dried and dressed in a set of dry clothes. If the possibility of hypothermia exists, seek medical attention immediately.

Persons sampling contaminated or potentially contaminated materials should wear the same PPE as listed for monitoring well sampling. The required PPE will be carried along on the sediment sampling water craft. PPE can add to heat stress during warm conditions and can cause decreased mobility dexterity.

#### 3.3.7.5 Subcontractors

It is the responsibility of the PM to require subcontractors assisting in the work activities, to adhere to state and federal governmental laws and regulations related to onshore and inland waters. Any refusal on behalf of the subcontractor will mandate shutdown of the project.

SECTION B Health and Safety Plan Section 4– Personnel Training Requirements Page 15 of 28

# 4 PERSONNEL TRAINING REQUIREMENTS

# 4.1 General

NRT and subcontractor employees performing field work on this project are required to have appropriate safety training as specified in the OSHA Standards, particularly the HAZWOPER Standard 29CFR1910.120. NRT personnel performing fieldwork on this project must meet the necessary general training requirements. Subcontractors are responsible for supplying NRT's PM with written statements certifying that their project personnel meet the necessary general training requirements.

## 4.2 Site-Specific

Site-specific hazard and hazard control information is contained in this health and safety plan. NRT personnel will be provided with a copy of this plan prior to the beginning of fieldwork. Each person will be required to "sign off" that they have read, understood, and will follow the procedures set forth in the plan.

# 4.3 Informational Briefings

It is the responsibility of each NRT staff member directing field operations to keep their crew members appraised of site conditions relative to health and safety, and of any approved modifications to the plan. This will be accomplished through ongoing daily "tailgate" safety meetings. NRT personnel are required to report injuries, illnesses, and unsafe conditions to their immediate supervisor. The supervisor is required to report in writing any such accidents to the HSM, PM, and PHSO within 24 hours of occurrence.

SECTION B Health and Safety Plan Section 5- Personal Protective Equipment Page 16 of 28

# **5 PERSONAL PROTECTIVE EQUIPMENT**

Listed in the health and safety plan summary at the very beginning of this plan are hazardous substances that have been found or are suspected to be present at the site. Hazardous substances may be found in air, soil, sediment, surface water and/or groundwater. Common routes of exposure include inhalation, ingestion, and absorption. Proper PPE should be worn when applicable.

## 5.1 Drilling/Excavation/Installation of Wells

Persons handling contaminated or potentially contaminated equipment, soils, sediment, or groundwater must wear the following PPE:

- Long sleeve coveralls (light or heavy weights subject to ambient temperature)
- Bib style rain pants where wet operations exist
- Nitrile gloves
- Vinyl gloves for sample handling
- Safety glasses with side-shields (REQUIRED AT ALL TIMES)
- Hard hat (REQUIRED AT ALL TIMES)
- Steel-toed boots (REQUIRED AT ALL TIMES)
- Reflective orange vest (worn as the situation warrants )
- Hearing protection (as required see note below)

**NOTE**: Guidance on the requirements of ear protection is as follows: if you must raise your voice to converse with persons three feet away from you, you are probably being overexposed to noise. This roughly equates to being exposed to over 85 dbs of noise for greater than a 4 hour period. In these instances, the wearing of hearing protection is required. The muff or "EAR" type disposable earplugs will suffice.

## 5.2 Ground/Surface Water and Soil/Sediment Sampling

Persons sampling contaminated or potentially contaminated materials, soil, sediment, or water must wear the following PPE:

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- Long sleeve coveralls (light or heavy weights subject to ambient temperature)
- Bib style rain pants where wet operations exist
- Nitrile gloves
- Vinyl gloves for sample handling
- Safety glasses with side-shields
- Steel-toed boots
- Hearing protection (as required)

Persons whose skin or inner clothing comes in contact with contaminated soils or liquids should remove such clothing, shower or clean as appropriate, then re-suit for continued work activities.

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SECTION B Health and Safety Plan Section 6– Medical Surveillance Requirements Page 18 of 28

# 6 MEDICAL SURVEILLANCE REQUIREMENTS

# 6.1 Medical Surveillance

The hazardous substances known or suspected to be present at the site are not known to produce injury or illness that would not be detected by the medical examination specified in the NRT Standard Practices Manual, Section 6, Health and Safety, Number 06-10. The medical monitoring program established in this section of the Standard Practices Manual complies with all OSHA guidelines regarding and necessitating medical monitoring in the work place.

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SECTION B Health and Safety Plan Section 7– Frequency and Types of Air Monitoring/Sampling Page 19 of 28

# 7 FREQUENCY AND TYPES OF AIR MONITORING/SAMPLING

# 7.1 Site Air Monitoring

A PID and possibly a combustible gas indicator (CGI) may be used to measure air contaminant concentrations in the breathing and work zones if required in the Health and Safety Plan Summary. Readings are to be recorded on the logs and in the project logbook. The PID will be calibrated per the air monitoring action plan below. If a CGI is also used to detect combustible conditions at the work site, the monitoring will also follow the plan below.

# 7.2 Sampling Air Monitoring

A PID may be used to measure air VOC concentrations at the well head or soil sample location during sampling or drilling operations if required in the Health and Safety Plan Summary. If measurements are collected, they should be recorded in the project logbook. These measurements may be used to upgrade or change PPE requirements and/or the methods of performing the work. The PID will be calibrated at the start of each day of use. Air monitoring should follow the action plan below.

## 7.3 Air Monitoring Action Plan

A PID will be calibrated and checked on a minimum basis at least three times per day: 1) before work activities begin; 2) during lunch break or approximately half way through the working day; and 3) following work activities at the end of the day. These calibration checks will be used to ensure accuracy of VOC readings. Calibration procedures will follow those outlined in the PID manual and NRT's SOPs and typically use isobutylene as the calibration gas.

The PID will be used to monitor air quality in the breathing zone of the work area for the presence of VOC vapor levels if required in the Health and Safety Plan Summary. Prior to Contractor Personnel entering any excavations to install piping or any other equipment, the PID will be lowered into the excavation to determine air quality in the excavation. Confined spaces will not be entered. Besides using the PID to monitor VOC vapors in the breathing zone, an oxygen meter and/or a CGM may also be used. The oxygen meter may be used to measure percent oxygen in any excavation and the CGM may be used to measure the explosive limit. Calibration of the combustible gas meter is required based on use to insure accuracy.

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### SECTION B Health and Safety Plan Section 7– Frequency and Types of Air Monitoring/Sampling Page 20 of 28

The VOCs "action level" is considered when a reading of 50 ppm is sustained on the PID when the PID is held at a constant height, whether in the excavation or the breathing zone. Reaching the VOC action level will require use of either full-face or half-face respirators utilizing Organic Vapor cartridge filters. Additionally, further air quality monitoring will be required to ensure that the PID readings do not exceed a sustained reading of 500 ppm. This will be done under the direction of the NRT PHSO who will determine specific modifications to work practices and PPE requirements.

If the 500-ppm action level is achieved, all activities on the site will immediately stop. The NRT PM will be contacted prior to taking any further action on the site, unless a situation exists which requires immediate action. Options such as nitrogen purging will be considered based on the most current information available.

It should be noted that action levels are determined by the contaminants present (if known). For example the action level for known petroleum contaminants (gasoline or diesel fuel) may be as indicated in the preceding paragraph. However, if chlorinated solvents are suspected to be present with much lower threshold limit values than petroleum contaminants then the action levels would be adjusted to lower values.

SECTION B Health and Safety Plan Section 8– Site Control Measures Page 21 of 28

# **8 SITE CONTROL MEASURES**

### 8.1 Buddy System

Each worker will maintain visual contact with another worker at all times. The buddy system will ensure against an employee becoming stressed with a co-worker being aware of his or her condition. Workers should watch out for each other while working close to potential chemical and physical hazards. For example, all work in the exclusion zone should be scheduled so that no employee works alone in this zone at any time.

## 8.2 Safe Work Practices

To prevent accidental ingestion of chemical contaminants, the following rules must be compiled with when working within the exclusion/contamination reduction zones, and when taking or handling samples.

- No eating, drinking, or smoking is allowed at work locations
- No fires are allowed at work locations unless approved by the Project Health and Safety Officer on a site-specific, task-specific basis. If fires or propane torches are used, fires will be maintained away from potential ignition sources and site personnel will not leave the fire unattended and a fire extinguisher will be immediately available
- NRT and contractor personnel must wash their hands, arms, face, and neck immediately after leaving the exclusion/contamination reduction zones. This must also be done after taking samples and prior to eating, drinking, smoking, or using the restroom

## 8.3 Work Zone Definition

Work crews, whether drilling, excavating, or performing other activities, must prevent the uncontrolled movement of contaminated or potentially contaminated soil, water, PPE, and equipment. All soil and water removed from its natural setting should be considered contaminated unless proven otherwise by chemical analysis or specifically known to be clean material in which verification sampling is occurring. This is also the case for PPE and equipment which either must be decontaminated or disposed. Work crews will prevent migration of contaminated materials by establishing work zones and decontamination procedures. Work zones will be delineated. Only persons certified as having the necessary training and medical qualifications will be allowed in the Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ). The following describes the zones to be established during drilling or excavation:

Exclusion Zone: An EZ will be established surrounding the drilling or excavation site, if necessary and is the area where contamination does exist or could occur. The EZ will comprise an area of at

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#### SECTION B Health and Safety Plan Section 8– Site Control Measures Page 22 of 28

least as large as a circle having a diameter equaling one half the mast height of the drilling equipment or arm of excavating equipment. The size and shape of the EZ will be determined by the PHSO. No personnel will be permitted in the EZ unless they are in full compliance with the site health and safety plan

- Contamination Reduction Zone: This is the transition area between the exclusion zone and the support zone. It is the area where the decontamination of equipment and personnel takes place. Its purpose is to keep the support zone free of contamination
- Support Zone: The support zone is the area free of contamination. People wear normal work clothes in this area. The personnel in this zone are responsible for organizing off-site emergency response teams in the event of an emergency

## 8.4 Daily Start-up and Shutdown Procedures

The following protocols will be followed daily prior to the start of work activities:

- The PHSO will review site conditions to determine if modifications of the work and safety plans are needed
- Personnel will be briefed and updated at the daily tailgate safety meeting on any new safety procedures based on the previous day's findings and the planned work activity for that day
- All safety equipment will be checked for proper function
- The PHSO will ensure that the hospital route map and first aid equipment are readily available; and
- The PHSO will initiate appropriate monitoring.

The following protocol will be followed at the end of daily operations and before breaks:

- All personnel will proceed through appropriate decontamination procedures and facilities;
- The work site will be left clean. Drums will be properly labeled and staged; and
- All PPE must be removed prior to eating, drinking, smoking, or using the restroom.
- Equipment will be decontaminated and properly stored.

### 8.5 Equipment

Drilling rigs and heavy equipment should be inspected at the start of each day to detect equipment problems. Particular attention should be paid to cables and hydraulic lines. Examine them for evidence of stretching, fraying and cracking. The fuel system and hydraulic system should be in good repair (free from leaks) to avoid the potential for fire or explosion. Kill switches should be tested and functioning properly. The drill rig and heavy equipment should be equipped with or have stationed in the area two 20-pound type BC fire extinguishers.

SECTION B Health and Safety Plan Section 8– Site Control Measures Page 23 of 28

# 8.6 Drilling/Excavation Area

The drilling/excavation area should be located away from overhead electrical lines. The location of buried water, storm and sanitary sewer, electrical, telephone, and gas utility lines must be determined and marked by the authorized personnel. Slope of terrain, stability of embankments, soil load bearing ability, etc. should be evaluated in selection of the drilling/excavation locations.

SECTION B Health and Safety Plan Section 9 – Decontamination Plan Page 24 of 28

# 9 DECONTAMINATION PLAN

### 9.1 Decontamination Procedures

Personal decontamination will be accomplished by using good personal hygiene. Personal contamination should not occur if the protection methods specified in this plan are used. However, the following procedures must be complied with to ensure that contamination does not remain on equipment, sample containers, or in contact with personnel.

- While in the EZ clean gross contamination off equipment by scraping or brushing. Collect all contaminated soil with the drill cuttings and transport the cuttings in an appropriate manner to the staging area on site (e.g., placed in DOT approved 55-gallon drums).
- If steam cleaning of equipment is required it will occur at the designated area on site. If capture of decontamination water is required, it will be placed in DOT approved 55-gallon drums.

After equipment and sample container decontamination is accomplished, drilling crewmembers must remove PPE before leaving the CRZ. PPE must be removed in a step-wise fashion to prevent contamination of work clothing, as follows:

- Remove all contaminated soil from work boots and remove protective clothing for decontamination or disposal. If disposable PPE is required, it should be placed in an open top drum designated for that purpose. A lid should be placed on the drum after usage. All drummed material will be labeled identifying contents and the date filled.
- Remove and wash outer gloves and hard hat. Place disposable gloves in a collection bag.
- The use of respiratory protection is not anticipated. If a respirator must be used or otherwise removed from its containers, wash it down and take it with you as you exit the CRZ.
- Final daily decontamination will be reviewed by the PHSO to ensure that no contaminated articles are accessible to the public. Therefore, all disposable PPE and other miscellaneous garbage will be stored in a drum with a secured lid.

After leaving the CRZ, and before eating, drinking, smoking, or using the restroom, all personnel must wash their hands, arms, face, and neck. In addition, all personnel should take a full-body shower at the end of the workday. A full-body shower includes the use of a wash cloth to scrub the skin.

## 9.2 Waste Storage and Disposal

Since all soil and water removed from its natural setting is considered potentially contaminated, these materials will be stored and disposed of according to the guidelines established in the Work Plan for the site. If no guidelines have been established in the work plan for storage and disposal of these

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investigative wastes, the procedures outlined in NRT Standard Practices Manual, Section 6, Health and Safety, Number 06-07.

Waste container contents and identification will be made in the field log for future reference. The number of containers will be counted and assessed for the amount of content present in each (1/2 full, full). All containers will be distinctly labeled using a paint pen or marker. At a minimum the drum will be labeled with the following information:

- Company name
- Date contents added to drum
- Contents of drum (soil, water, PPE)
- Well or soil boing identification (MW-1 or SB-1)

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SECTION B Health and Safety Plan Section 10– Emergency Action Plan Page 26 of 28

# **10 EMERGENCY ACTION PLAN**

### 10.1 Medical Emergencies

In the event of a medical emergency, the following procedures should be used.

- 1. If serious injury or life-threatening condition exists, call 911. Clearly describe the location, injury, and conditions to the dispatcher. Designate a person to direct emergency responders to the injured person(s).
- 2. Call the project manager.
- 3. Implement steps to prevent the reoccurrence of the accident.

### 10.2 Chemical Emergencies

- 1. If serious injury or life-threatening condition exists, call 911. Clearly describe the location, injury, and conditions to the dispatcher.
- Evacuate other on-site personnel to a safe place in an upwind direction until it is safe for work to resume.
- 3. Call the PM.
- 4. If necessary contact clean-up contractor.
- If release requires contacting government agencies the PM makes the appropriate calls (PM also contacts Client).

### **10.3 General Emergencies**

In the case of fire (other than a managed pre-approved fire, discussed in Section 8.2), flood, explosion, spills, severe weather, tank or pipe punctures, or other hazard, work shall be halted and if applicable, 911 called. All on-site personnel will immediately be evacuated to a safe place.

### 10.4 Accident Reports and Follow up

All accidents, including those that do not result in injury or illness, are to be reported verbally to the PHSO or the PM immediately, with written documentation within 24 hours of their occurrence. The report form is included as Appendix B. The policy specified in the NRT Standard Practices Manual, Section 6, Health and Safety, Number 06-12 regarding notification of the HSM, PHSO or PM will be followed.

SECTION B Health and Safety Plan Section 11– Confined Space Entry Procedures Page 27 of 28

# **11 CONFINED SPACE ENTRY PROCEDURES**

No confined spaces (or the need to enter a confined space) are anticipated at the site; however, should such an issue arise (or become anticipated at a particular site), it will be addressed in the site specific work plan. Only properly trained individuals may enter or be an attendant for confined space entry and only after a confined space permit has been completed.

SECTION B Health and Safety Plan Section 12– Spill Containment Program Page 28 of 28

# **12 SPILL CONTAINMENT PROGRAM**

In the event of an accidental release of potentially hazardous materials or waste (e.g., spilled purge water or soil cuttings, ruptured hydraulic line), site personnel will:

- Contact the HSM, Project Health and Safety Officer and Project Manager
- Contain the spill, if it is possible and it can be done safely
- Initiate cleanup
- Report the spill to the proper authorities if the spill volume is a reportable quantity

# Appendix A Chemical Information / Material Safety Data Sheets

# Appendix B Accident / Injury or Near Miss Report Form



ACCIDENT/INJURY OR NEAR MISS REPORT FORM

ENVIRONMENTAL CONSULTANTS

Incident Date (required):

Incident Time (required):

Incident Location (Minimum of State and County with City/Town and project site name optimal):

Was Anyone Injured? YES

NO Name of Injured:

Use a separate form for EACH injured individual

List Witness (if applicable):

Last previous workday for injured individual:

Name(s) and Date(s) NRT personal notified of Incident:

Description of Incident (list all tools and equipment):

Description of Injury (if applicable). Injury description must specify body part(s) and body side if applicable (e.g., left arm, right foot, right eye):

Did anything "cause" the incident (if applicable):

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# ACCIDENT/INJURY OR NEAR MISS REPORT FORM Page 2

### Describe Company First Aid (if applicable):

### Emergency Crew and/or Physician's Treatment (if applicable):

Corrective Action (if applicable):

### Additional Comments (if applicable)

Reported By: ______
Health & Safety Coordinator: ______
Project Manager (if applicable): ______
Supervisor: ______

Date: _____ Date: _____ Date: _____ Date: _____

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