



October 31, 2018

Project No. 30401358

Ms. Maureen Hatfield

Texas Commission on Environmental Quality
MC-127
VCP-CA Section, Team 1, Remediation Division
P.O. Box 13087
Austin, Texas 78711-3087



**RE: MONTHLY STATUS UPDATE – SOIL CAP AND CONCRETE CAP REPAIRS
UNION PACIFIC RAILROAD HOUSTON WOOD PRESERVING WORKS FACILITY
4910 LIBERTY ROAD FACILITY, HOUSTON, TEXAS
POST-CLOSURE CARE PERMIT NO. HW-50343; INDUSTRIAL SWR NO. 31547**

Dear Ms. Hatfield:

Golder Associates, Inc. (Golder), formerly Pastor, Behling & Wheeler, LLC (PBW), on behalf of Union Pacific Railroad Company (UPRR), is pleased to provide this monthly status update for the implementation of the cap repairs identified in the Updated Post-Response Action Care Report (PRACR) dated January 16, 2018 for the UPRR Houston Wood Preserving Works Facility (the Site). Monthly status updates were requested by the Texas Commission on Environmental Quality (TCEQ) in a letter dated March 20, 2018. This monthly status report also provides response to comments in a TCEQ letter dated October 24, 2018.

A brief description of the current status of the repairs is provided below:

- Soil Cap – Repairs to the soil cap were conducted on June 12 and 13, 2018. No further actions are necessary to address the soil cap repairs.
- Concrete Cap (Englewood Intermodal Yard) – Repairs to the concrete cap include addressing the seep area within parking slots B100 to B109 (for container trailers) where a tar-like substance was observed surfacing through the joints and cracks in the concrete and asphalt surfaces. Golder continues to conduct weekly inspections of the affected area. When significant amounts of the tar-like substance are observed on the concrete surface, a remediation contractor (United States Environmental Services (USES)) is notified to mobilize to the Site to remove and properly dispose of the material. As proposed in the August 31, 2018 monthly update, test pits to evaluate the tar-like material were conducted on October 3rd through 5th to evaluate the tar-like material. Details of the evaluation are provided in the following section.

Test Pits

Golder personnel documented the test pit excavation activities from October 3rd through 5th. The test pits were conducted within the primary area (slots B100-B109) and other areas (parking slots B13 and B54) where seeps of the tar-like material have been observed. The test pits were excavated by United Professional Services (United), a UPRR approved remediation contractor. Four test pits were excavated to approximately 2 feet wide, 6 feet long and 5 feet deep with a mini-excavator. Locations of the test pits (labeled Test Pit B13, Test Pit B54, Test Pit B100, and Test Pit B105 to coincide with the parking slots) are shown on the attached Figure 1. The excavated soils from the test pits were placed in a roll-off bin and sampled for waste characterization.

Each test pit was left open for approximately 12 to 24 hours after excavation to monitor for seepage of the tar-like material or non-aqueous phase liquid (NAPL) into the test pits. The NAPL substance was observed in each of the four test pits with the depth typically depending on level of the top of the subsurface hard, dark gray clay, as summarized below:

- a. B105 Test Pit – NAPL was encountered approximately 2 feet below ground surface (bgs) just below the road base on top of the hard, dark gray clay;
- b. B100 Test Pit – NAPL was encountered approximately 3 feet to 3.5 feet bgs just below a soft to firm gray silty clay on top of the hard, dark gray clay;
- c. B54 Test Pit – NAPL was encountered approximately 3.2 feet bgs just below a layer of light grey silty/clay type material, on top of the hard, dark gray clay; and
- d. B13 Test Pit – Depth varies, a silty clay with significant amounts of debris was encountered from below the road base to the bottom of the pit (5' bgs).

The NAPL observed in each test pit visually appeared to be similar at each location and was described as a black, viscous material. Photographs of the test pits are provided in Attachment A. The NAPL appeared to flow into the test pits slowly like a paste. During the test pit excavation, very little odor was observed and no photoionization detector (PID) readings were detected when the excavations were scanned with the field PID meter.

At each of the four test pits, a sample of the NAPL was collected, submitted to ALS Laboratory in Houston, Texas and analyzed for the following parameters to evaluate chemicals of concern (COCs) within in the NAPL:

- Total petroleum hydrocarbons (TPH) by Tx1005 Method,
- Volatile Organic Compounds (VOCs) by EPA 8260 Method,
- Semi-volatile organic compounds (SVOCs) by EPA 8270 Method,
- TPH fractionation by TX1006 Method, and
- Reactivity/ignitability/corrosivity.

A sample of the NAPL was also submitted to the laboratory for viscosity analysis. However, according to the laboratory, the viscosity analysis could not be performed on the sample. In addition to the NAPL samples, a sample of the test pit excavated soils placed in the roll off was collected and submitted for analysis for waste characterization. A soil sample of the light gray clay above the NAPL in the Test Pit B54 (2-3 feet bgs) was also collected to evaluate potential COCs in the overlying soils. The NAPL analytical results are summarized in Table 1, and the soil sample results are summarized in Table 2. The laboratory reports are provided in Attachment B.

Analytical Summary

The four NAPL samples results summarized on Table 1 were compared to Texas Risk Reduction Program (TRRP) Commercial/Industrial (C/I) Soil Tier 1 Protective Concentration Levels (PCLs) assuming a 30-acre source area. The COCs detected above method detection limits (MDLs) included the following:

- VOCs: acetone, benzene, ethylbenzene, and xylenes were detected; however, of these VOCs, benzene was detected in only one of the NAPL samples (Sample ID NAPL-1620-TPB100-20181005 from Test Pit B100) above the soil C/I Tier 1 PCL (0.103 mg/kg) at 0.017J mg/kg. None of the other VOCs detected in the NAPL samples exceeded the soil C/I Tier 1 PCLs.
- SVOCs: 2-methylnaphththalene, acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, di-n-butyl phthalate, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeo(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene were detected in the NAPL samples. However, none of the SVOCs detected had concentrations greater than their respective C/I Tier 1 PCLs. The COCs typically found in creosote NAPL at significant concentrations (benzene, 2-methylnaphthalene, and naphthalene) were either not detected or detected at concentrations near the MDLs for those COCs; indicating that the NAPL is not likely associated with creosote.
- TPH by TX1005: The four NAPL samples had TPH concentrations ranging from 23,000 mg/kg to 35,000 mg/kg, with the highest concentrations detected in the C₁₂-C₂₈ TPH range.

Each NAPL sample was also analyzed for TPH fractionation by TX1006 Method. The four samples appear to have a similar distribution of TPH fractions. Using the TCEQ Tier 1 TPH PCL Calculator (v 2.0 – 12/2016), a Tier 1 PCL for Total TPH was established (Attachment C). Based on the TPH TX1006 results from the NAPL sample collected from Test Pit B100, the hazard index was less than 10 and the TPH concentration is considered protective of the underlying groundwater, therefore, a ^{GW}Soil_{ing} PCL was not calculated. The 30-Acre C/I Tier 1 ^{Tot}Soil_{Comb} PCL of 46,900 mg/kg was established as the appropriate Tier 1 PCL. None of the NAPL samples had total TPH concentrations greater than the calculated TPH PCL.

The soil sample (Sample ID: SO-1620-TPSoils-20181005) collected from the roll-off bin represents the soils excavated from the test pits. The analytical results from this sample (Table 2) did not indicate any toxicity characteristic leaching procedure (TCLP) metal, VOC, or SVOC concentrations that exceeded the TCLP Regulatory Levels detailed in the TCEQ *Guidelines for the Classification and Coding of Industrial and Hazardous Wastes*, RG-022 (Revised 11/14). The TPH concentrations in the roll-off soil sample exceeded 1,500 mg/kg, which according to the TCEQ RG-022 document would be considered Class I non-hazardous. UPRR is in the process of profiling and disposing of the soils contained in the roll-off bin. UPRR will submit the final waste manifest after it has been received from a permitted landfill facility.

Proposed Response Action

Based on the test pits and borings conducted in the area of the NAPL seeps and the frequency of the occurrence of surface seepage at the B100 to B110 parking slots, the seeps appear to be a result of the volume of the shallow NAPL within the top 3 feet bgs mobilizing during warm weather and, to relieve subsurface pressure, finding preferential pathways to the surface through the concrete pavement's expansion joints and through the cracks in the asphalt pavement. Therefore, the proposed response objective is to provide alternative preferential pathways for the NAPL to travel to and be recovered prior to seeping to the ground surface.

As detailed in the August 31, 2018 monthly update, the proposed response action to address the seeps was to install a NAPL recovery system by removing a section of asphalt or concrete cover, excavating the underlying soils, backfilling with high permeability fill, installing slotted pipe to allow the accumulation of NAPL and backfilling the remaining few feet with compacted selected fill and reinforced concrete. Based on the observations from the test pits, the following revised response action is proposed to evaluate shallow NAPL recovery and reduce or eliminate the NAPL seeps from migrating to the ground surface:

- Saw cut and remove the asphalt or concrete cover (approximately 1,275 square feet of area);
- Excavate the existing road base, soil and debris to a depth of approximately 4 feet below grade. The estimated volume of material (concrete or asphalt, soil) to be removed is approximately 189 cubic yards (in-place). The excavated material will be placed in roll-off boxes, profiled for disposal, and disposed at a permitted landfill facility;
- Place a geotextile fabric at the base of the excavation, overlain with approximately 28 inches of high permeability fill (i.e., gravel) to allow the collection of NAPL in the NAPL collection zone;
- Install three sumps consisting of vertical 24-in diameter (or similar) HDPE plastic pipes to a depth of 4 feet below grade, with slotted pipe/perforations in the lower 28 inches of the pipe to allow the recovery of NAPL that may collect in the NAPL collection zone; and
- Backfill the remaining 20 inches of the excavation with a combination of compacted select fill, compacted base material, and reinforced concrete to return the ground surface for parking of the container trailers.

The revised preliminary design drawings are provided on Figures 2 and 3.

Equally spaced subsurface collections points (i.e., sumps) surrounded by high permeability backfill will provide a subsurface endpoint for the NAPL to travel to as needed to relieve subsurface pressure during warm weather (See Figure 3). Based on the observations from the test pits, seepage of NAPL to the surface should cease or be dramatically reduced in the locality of the sumps (particularly in the region of the B100-B110 parking slots). The initial response action proposed in the September 2018 monthly update only consisted of one sump feature. The revised plan will include up to three sumps to be installed. The sumps are proposed to be placed each approximately 40' from each other (See Figure 2). As NAPL enters the subsurface collection points, it will be collected from the sumps and properly disposed of at a permitted landfill facility.

Due to the wide spread presence of the NAPL below the Englewood Yard's B-Row based on the test pits, the potential exists that the NAPL will find additional preferential pathways to the surface at other locations. The currently proposed interim measure will serve the dual purpose of immediately remediating the local seepage issue and of providing an assessment of the proposed solution's level of effectiveness (e.g. better evaluation of the sumps radius of influence). If the proposed solution is found to be effective, this remedial approach may be considered at the location of future seepage areas. If the proposed response action is not effective, UPRR will evaluate and implement additional response actions as necessary to address the NAPL seeps.

Per the TCEQ letter dated October 24, 2018, UPRR is prepared to implement the proposed response action design discussed above pending TCEQ review.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Kevin Peterburs of UPRR at (414) 267-4164.

Sincerely,

Golder Associates Inc.



R. Bryan Luper, P.E.
Senior Engineer
Texas PE #83963



Eric C. Matzner, P.G.
Senior Consultant / Associate

RBL/ECM

CC: Mr. Kevin Peterburs, UPRR – Milwaukee, WI

Attachments: Figure 1 – Site Map
Figure 2 – Proposed Remedial Excavation
Figure 3 – Proposed NAPL Collection System
Attachment A – Test Pit Photographs
Attachment B – Test Pit Laboratory Analytical Reports
Attachment C – TCEQ TRRP Tier 1 TPH PCL Calculator Results

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Tables

Table 1

**Summary of NAPL Samples From Test Pits
Englewood Intermodal Yard - Seep Investigation**

Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30-Acre)	NAPL-1620-TPB105-201 81005	NAPL-1620-TPB100-201 81005	NAPL-1620-TPB54-201 81005	NAPL-1620-TPB13-20 181005
RCI (Reactivity, Corrosivity, Ignitability)						
pH	pH Units	N/A	8.97 H	8.67 H	11.3 H	9.55 H
Temp Deg C pH	pH Units	N/A	21.1 H	21.2 H	20.9 H	21.0 H
Ignitability, Solid	Burn Rate, mm/sec	N/A	Negative	Negative	Negative	Negative
Reactive Cyanide	mg/Kg	N/A	<100	<100	<100	<100
Reactive Sulfide	mg/Kg	N/A	<100	<100	<100	<100
Volatile Organic Compounds (SW8260)						
1,1,1-Trichloroethane	mg/Kg	0.81	<0.0046	<0.0044	<0.0041	<0.0045
1,1,2,2-Tetrachloroethane	mg/Kg	0.026	<0.0074	<0.0070	<0.0066	<0.0072
1,1,2-Trichloroethane	mg/Kg	0.01	<0.0046	<0.0044	<0.0041	<0.0045
1,1-Dichloroethane	mg/Kg	28	<0.0046	<0.0044	<0.0041	<0.0045
1,1-Dichloroethene	mg/Kg	0.025	<0.0046	<0.0044	<0.0041	<0.0045
1,2-Dichlorobenzene	mg/Kg	8.9	<0.0092	<0.0088	<0.0082	<0.0090
1,2-Dichloroethane	mg/Kg	0.0069	<0.0055	<0.0053	<0.0049	<0.0054
1,2-Dichloroethene, Total	mg/Kg	N/A	<0.0046	<0.0044	<0.0041	<0.0045
1,2-Dichloropropane	mg/Kg	0.011	<0.0074	<0.0070	<0.0066	<0.0072
1,3-Dichlorobenzene	mg/Kg	10	<0.0092	<0.0088	<0.0082	<0.0090
1,4-Dichlorobenzene	mg/Kg	1.1	<0.0092	<0.0088	<0.0082	<0.0090
2-Butanone	mg/Kg	44	<0.012	<0.011	<0.011	<0.012
2-Hexanone	mg/Kg	0.48	<0.013	<0.012	<0.011	<0.013
4-Methyl-2-pentanone	mg/Kg	7.4	<0.018	<0.018	<0.016	<0.018
Acetone	mg/Kg	64	0.2	0.23	<0.016	<0.018
Benzene	mg/Kg	0.013	0.012 J	0.017 J	<0.0041	<0.0045
Bromochloromethane	mg/Kg	4.5	<0.0083	<0.0079	<0.0074	<0.0081
Bromodichloromethane	mg/Kg	0.073	<0.0046	<0.0044	<0.0041	<0.0045
Bromoform	mg/Kg	0.71	<0.0055	<0.0053	<0.0049	<0.0054
Bromomethane	mg/Kg	0.2	<0.0092	<0.0088	<0.0082	<0.0090
Carbon disulfide	mg/Kg	20	<0.0055	<0.0053	<0.0049	<0.0054
Carbon tetrachloride	mg/Kg	0.031	<0.0055	<0.0053	<0.0049	<0.0054
Chlorobenzene	mg/Kg	0.55	<0.0055	<0.0053	<0.0049	<0.0054
Chloroethane	mg/Kg	46	<0.0074	<0.0070	<0.0066	<0.0072
Chloroform	mg/Kg	1.5	<0.0046	<0.0044	<0.0041	<0.0045
Chloromethane	mg/Kg	0.45	<0.0046	<0.0044	<0.0041	<0.0045
cis-1,2-Dichloroethene	mg/Kg	0.12	<0.0074	<0.0070	<0.0066	<0.0072
cis-1,3-Dichloropropene	mg/Kg	0.0074	<0.0046	<0.0044	<0.0041	<0.0045
Dibromochloromethane	mg/Kg	0.055	<0.0046	<0.0044	<0.0041	<0.0045
Ethylbenzene	mg/Kg	3.8	0.092	0.21	0.033 J	0.039 J
m,p-Xylene	mg/Kg	N/A	0.031 J	0.048 J	0.048 J	0.035 J
Methylene chloride	mg/Kg	0.0065	<0.0092	<0.0088	<0.0082	<0.0090
o-Xylene	mg/Kg	35	0.051	0.11	0.046	0.064
Styrene	mg/Kg	1.6	<0.0064	<0.0062	<0.0057	<0.0063
Tetrachloroethene	mg/Kg	0.025	<0.0064	<0.0062	<0.0057	<0.0063
Toluene	mg/Kg	4.1	0.029 J	0.038 J	0.030 J	0.085
trans-1,2-Dichloroethene	mg/Kg	0.25	<0.0046	<0.0044	<0.0041	<0.0045
trans-1,3-Dichloropropene	mg/Kg	0.04	<0.0055	<0.0053	<0.0049	<0.0054
Trichloroethene	mg/Kg	0.017	<0.0055	<0.0053	<0.0049	<0.0054
Vinyl acetate	mg/Kg	80	<0.0092	<0.0088	<0.0082	<0.0090
Vinyl chloride	mg/Kg	0.011	<0.0074	<0.0070	<0.0066	<0.0072
Xylenes, Total	mg/Kg	61	0.082	0.16	0.094	0.099

Table 1

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Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30-Acre)	NAPL-1620-TPB105-201 81005	NAPL-1620-TPB100-201 81005	NAPL-1620-TPB54-201 81005	NAPL-1620-TPB13-20 181005
Semivolatile Organic Compounds (SW8270)						
1,2,4-Trichlorobenzene	mg/Kg	2.4	<0.0072	<0.071	<0.070	<0.0071
2,4,5-Trichlorophenol	mg/Kg	51	<0.015	<0.15	<0.15	<0.015
2,4,6-Trichlorophenol	mg/Kg	0.26	<0.010	<0.10	<0.100	<0.010
2,4-Dichlorophenol	mg/Kg	0.53	<0.0078	<0.077	<0.076	<0.0077
2,4-Dimethylphenol	mg/Kg	4.8	<0.020	<0.20	<0.19	<0.020
2,4-Dinitrophenol	mg/Kg	0.14	<0.027	<0.27	<0.26	<0.027
2,4-Dinitrotoluene	mg/Kg	0.006	<0.0054	<0.053	<0.053	<0.0053
2,6-Dinitrotoluene	mg/Kg	0.0054	<0.020	<0.20	<0.19	<0.020
2-Chloronaphthalene	mg/Kg	1000	<0.0078	<0.077	<0.076	<0.0077
2-Chlorophenol	mg/Kg	2.4	<0.0078	<0.077	<0.076	<0.0077
2-Methylnaphthalene	mg/Kg	25	0.021	<0.030	<0.029	0.022
2-Methylphenol	mg/Kg	11	<0.0066	<0.065	<0.065	<0.0065
2-Nitroaniline	mg/Kg	0.033	<0.011	<0.11	<0.11	<0.011
2-Nitrophenol	mg/Kg	0.2	<0.015	<0.15	<0.15	<0.015
3&4-Methylphenol	mg/Kg	N/A	<0.0060	<0.059	<0.059	<0.0059
3,3'-Dichlorobenzidine	mg/Kg	0.07	<0.015	<0.15	<0.15	<0.015
3-Nitroaniline	mg/Kg	0.038	<0.011	<0.11	<0.11	<0.011
4,6-Dinitro-2-methylphenol	mg/Kg	0.007	<0.013	<0.12	<0.12	<0.012
4-Bromophenyl phenyl ether	mg/Kg	0.4	<0.0096	<0.095	<0.094	<0.0095
4-Chloro-3-methylphenol	mg/Kg	6.8	<0.0042	<0.042	<0.041	<0.0042
4-Chloroaniline	mg/Kg	0.023	<0.0066	<0.065	<0.065	<0.0065
4-Chlorophenyl phenyl ether	mg/Kg	0.036	<0.0090	<0.089	<0.088	<0.0089
4-Nitroaniline	mg/Kg	0.12	<0.013	<0.13	<0.13	<0.013
4-Nitrophenol	mg/Kg	0.15	<0.011	<0.11	<0.11	<0.011
Acenaphthene	mg/Kg	350	0.086	0.077 J	0.16 J	0.13
Acenaphthylene	mg/Kg	610	0.11	0.10 J	0.12 J	0.074
Anthracene	mg/Kg	10000	0.32	0.36	0.55	0.53
Benz(a)anthracene	mg/Kg	150	1.4	1.4	2.1	1.7
Benzidine	mg/Kg	0.000012	<0.0084	<0.083	<0.082	<0.0083
Benzo(a)pyrene	mg/Kg	3.8	1.2	1.6	2.2	1.8
Benzo(b)fluoranthene	mg/Kg	170	1.5	1.8	2.8	2.2
Benzo(g,h,i)perylene	mg/Kg	19000	0.88	1.2	2	1.7
Benzo(k)fluoranthene	mg/Kg	1700	0.81	0.91	1.6	1.5
Benzyl alcohol	mg/Kg	8.7	<0.0042	<0.042	<0.041	<0.0042
Bis(2-chloroethoxy)methane	mg/Kg	0.013	<0.0054	<0.053	<0.053	<0.0053
Bis(2-chloroethyl)ether	mg/Kg	0.0024	<0.0066	<0.065	<0.065	<0.0065
Bis(2-chloroisopropyl)ether	mg/Kg	0.21	<0.0084	<0.083	<0.082	<0.0083
Bis(2-ethylhexyl)phthalate	mg/Kg	82	<0.010	<0.10	<0.100	<0.010
Butyl benzyl phthalate	mg/Kg	300	<0.0078	<0.077	<0.076	<0.0077
Carbazole	mg/Kg	5.1	0.13	0.13 J	0.22 J	0.21
Chrysene	mg/Kg	13000	1.6	1.7	2.5	2.1
Di-n-butyl phthalate	mg/Kg	5000	0.1	<0.071	0.16 J	0.075
Di-n-octyl phthalate	mg/Kg	6800	<0.0054	<0.053	<0.053	<0.0053
Dibenz(a,h)anthracene	mg/Kg	17	0.23	0.26	0.47	0.39
Dibenzofuran	mg/Kg	50	0.05	0.071 J	0.089 J	0.087
Diethyl phthalate	mg/Kg	230	<0.0060	<0.059	<0.059	<0.0059
Dimethyl phthalate	mg/Kg	93	<0.0048	<0.047	<0.047	<0.0048
Fluoranthene	mg/Kg	2900	1	3.7	5.4	4.5

Table 1

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Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30-Acre)	NAPL-1620-TPB105-201 81005	NAPL-1620-TPB100-201 81005	NAPL-1620-TPB54-201 81005	NAPL-1620-TPB13-20 181005
Fluorene	mg/Kg	450	0.084	0.11 J	0.15 J	0.12
Hexachlorobenzene	mg/Kg	0.56	<0.0054	<0.053	<0.053	<0.0053
Hexachlorobutadiene	mg/Kg	3.7	<0.0072	<0.071	<0.070	<0.0071
Hexachlorocyclopentadiene	mg/Kg	9.6	<0.0048	<0.047	<0.047	<0.0048
Hexachloroethane	mg/Kg	1.9	<0.0090	<0.089	<0.088	<0.0089
Indeno(1,2,3-cd)pyrene	mg/Kg	170	0.88	1.3	1.8	1.7
Isophorone	mg/Kg	3.4	<0.0048	<0.047	<0.047	<0.0048
N-Nitrosodi-n-propylamine	mg/Kg	0.00039	<0.0066	<0.065	<0.065	<0.0065
N-Nitrosodimethylamine	mg/Kg	0.000041	<0.0072	<0.071	<0.070	<0.0071
N-Nitrosodiphenylamine	mg/Kg	3.2	<0.0042	<0.042	<0.041	<0.0042
Naphthalene	mg/Kg	47	0.032	<0.036	<0.035	0.04
Nitrobenzene	mg/Kg	0.52	<0.0054	<0.053	<0.053	<0.0053
Pentachlorophenol	mg/Kg	0.0092	<0.020	<0.20	<0.19	<0.020
Phenanthrene	mg/Kg	620	2	2.1	2.9	2.6
Phenol	mg/Kg	29	<0.0066	<0.065	<0.065	<0.0065
Pyrene	mg/Kg	1700	0.87	3.2	4.8	4
Total Petroleum Hydrocarbons (TX1005)						
>nC12 to nC28	mg/Kg	300	17000	31000	29000	19000
>nC28 to nC35	mg/Kg	300	2100 J	3300 J	2300 J	2400 J
nC6 to nC12	mg/Kg	97	5000	1100 J	1600 J	1800 J
Total Petroleum Hydrocarbon	mg/Kg	N/A	24000	35000	33000	23000
Total Petroleum Hydrocarbons (TX1006)						
Aliphatics nC6	mg/Kg	N/A	0	0	0	0
Aliphatics >nC6 to nC8	mg/Kg	N/A	<4.9	<4.8	<4.7	<4.9
Aliphatics >nC8 to nC10	mg/Kg	N/A	<4.9	<4.8	<4.7	<4.9
Aliphatics >nC10 to nC12	mg/Kg	N/A	<4.9	<4.8	<4.7	<4.9
Aliphatics >nC12 to nC16	mg/Kg	N/A	<4.9	<4.8	24	<4.9
Aliphatics >nC16 to nC21	mg/Kg	N/A	19	47	55	12
Aliphatics >nC21 to nC35	mg/Kg	N/A	34	50	32	9.5 J
Aliphatics Relative % Distribution	mg/Kg	N/A	30	36	49	26
Aromatics >nC7 to nC8	mg/Kg	N/A	<490	<480	<470	<490
Aromatics >nC8 to nC10	mg/Kg	N/A	<490	<480	<470	<490
Aromatics >nC10 to nC12	mg/Kg	N/A	<490	<480	<470	<490
Aromatics >nC12 to nC16	mg/Kg	N/A	1000	1800	1400	1400
Aromatics >nC16 to nC21	mg/Kg	N/A	5400	8300	4800	2900
Aromatics >nC21 to nC35	mg/Kg	N/A	5700	7800	5200	2500
Aromatics Relative % Distribution	mg/Kg	N/A	70	64	51	74
Total Petroleum Hydrocarbons	mg/Kg	46900*	12153	17997	11511	6822

Notes: Soil PCLs - Tier 1 Commercial/Industrial PCLs listed are based on the lowest of $^{Tot}Soil_{Comb}$, $^{GW}Soil_{Ing}$ for a 30-acre source area. Last updated April 27, 2018.

Results with a "<" indicate that the analyte was analyzed but not detected above the Method Detection Limit (MDL).

Results with a "J" flag indicate that the analyte was detected above the MDL but below the quantitation limit.

Concentrations >PCL and >MDL are highlighted.

* TPH TX1006 PCL determined using the TCEQ soil TPH PCL calculator, Tier 1 $^{Tot}Soil_{Comb}$.

Table 2

**Summary of Soil Samples
Englewood Intermodal Yard - Test Pit Investigation**

Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30 Acre)	SO-1620-TPSoils-2018 1005	SO-1620-TPSoil(2-3)-2018 1005
RCI (Reactivity, Corrosivity, Ignitability)				
pH	pH Units	N/A	8.57 H	11.3 H
Ignitability, Solid	Burn Rate, mm/sec	N/A	Negative	Negative
Reactive Cyanide	mg/Kg	N/A	<100	<100
Reactive Sulfide	mg/Kg	N/A	<100	<100
Temp Deg C	C	N/A	21.1 H	21.0 H
TCLP Metals (SW1311/6020)				
Arsenic	mg/L	5*	0.00727 J	
Barium	mg/L	100*	2.1	
Cadmium	mg/L	1*	0.0265 J	
Chromium	mg/L	5*	<0.00400	
Lead	mg/L	5*	0.42	
Selenium	mg/L	1*	<0.0110	
Silver	mg/L	5*	<0.00200	
TCLP Mercury (SW7470)				
Mercury	mg/L	0.2*	<0.0000300	
TCLP Volatile Organic Compounds (SW1311/8260B)				
1,1-Dichloroethene	mg/L	0.7*	<0.010	
1,2-Dichloroethane	mg/L	0.5*	<0.010	
1,4-Dichlorobenzene	mg/L	7.5*	<0.012	
2-Butanone	mg/L	200*	<0.020	
Benzene	mg/L	0.5*	<0.012	
Carbon tetrachloride	mg/L	0.5*	<0.012	
Chlorobenzene	mg/L	100*	<0.0080	
Chloroform	mg/L	6*	<0.012	
Tetrachloroethene	mg/L	0.7*	<0.012	
Trichloroethene	mg/L	0.5*	<0.010	
Vinyl chloride	mg/L	0.2*	<0.0080	
TCLP Semivolatile Organic Compounds (SW1311/8270)				
2,4,5-Trichlorophenol	mg/L	400*	<0.00092	
2,4,6-Trichlorophenol	mg/L	2*	<0.0014	
2,4-Dinitrotoluene	mg/L	10*	<0.0010	
Cresols, Total	mg/L	200*	<0.0020	
Hexachlorobenzene	mg/L	0.13*	<0.0011	
Hexachlorobutadiene	mg/L	0.5*	<0.0011	
Hexachloroethane	mg/L	3*	<0.0010	
Nitrobenzene	mg/L	2*	<0.00082	
Pentachlorophenol	mg/L	100*	<0.0016	
Pyridine	mg/L	5*	<0.0020	
Metals (SW6020)				
Arsenic	mg/Kg	5.9		1.17
Barium	mg/Kg	300		9.2
Cadmium	mg/Kg	0.75		0.162 J
Chromium	mg/Kg	1200		1.91
Lead	mg/Kg	15		10.4
Selenium	mg/Kg	1.1		0.462 J
Silver	mg/Kg	0.71		0.0317 J

Table 2

**Summary of Soil Samples
Englewood Intermodal Yard - Test Pit Investigation**

Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30 Acre)	SO-1620-TPSoils-2018 1005	SO-1620-TPSoil(2-3)-2018 1005
Mercury (SW7471A)				
Mercury	mg/Kg	0.04		0.00318 J
Volatile Organic Compounds (SW8260)				
1,1,1-Trichloroethane	mg/Kg	0.81		<0.00050
1,1,2,2-Tetrachloroethane	mg/Kg	0.026		<0.00080
1,1,2-Trichloroethane	mg/Kg	0.01		<0.00050
1,1-Dichloroethane	mg/Kg	28		<0.00050
1,1-Dichloroethene	mg/Kg	0.025		<0.00050
1,2-Dichlorobenzene	mg/Kg	8.9		<0.0010
1,2-Dichloroethane	mg/Kg	0.0069		<0.00060
1,2-Dichloroethene, Total	mg/Kg	N/A		<0.00050
1,2-Dichloropropane	mg/Kg	0.011		<0.00080
1,3-Dichlorobenzene	mg/Kg	10		<0.0010
1,4-Dichlorobenzene	mg/Kg	1.1		<0.0010
2-Butanone	mg/Kg	44		<0.0013
2-Hexanone	mg/Kg	0.48		<0.0014
4-Methyl-2-pentanone	mg/Kg	7.4		<0.0020
Acetone	mg/Kg	64		0.085
Benzene	mg/Kg	0.013		<0.00050
Bromochloromethane	mg/Kg	4.5		<0.00090
Bromodichloromethane	mg/Kg	0.073		<0.00050
Bromoform	mg/Kg	0.71		<0.00060
Bromomethane	mg/Kg	0.2		<0.0010
Carbon disulfide	mg/Kg	20		<0.00060
Carbon tetrachloride	mg/Kg	0.031		<0.00060
Chlorobenzene	mg/Kg	0.55		<0.00060
Chloroethane	mg/Kg	46		<0.00080
Chloroform	mg/Kg	1.5		<0.00050
Chloromethane	mg/Kg	0.45		<0.00050
cis-1,2-Dichloroethene	mg/Kg	0.12		<0.00080
cis-1,3-Dichloropropene	mg/Kg	0.0074		<0.00050
Dibromochloromethane	mg/Kg	0.055		<0.00050
Ethylbenzene	mg/Kg	3.8		<0.00070
m,p-Xylene	mg/Kg	N/A		<0.0016
Methylene chloride	mg/Kg	0.0065		<0.0010
o-Xylene	mg/Kg	35		<0.0010
Styrene	mg/Kg	1.6		<0.00070
Tetrachloroethene	mg/Kg	0.025		<0.00070
Toluene	mg/Kg	4.1		<0.00060
trans-1,2-Dichloroethene	mg/Kg	0.25		<0.00050
trans-1,3-Dichloropropene	mg/Kg	0.04		<0.00060
Trichloroethene	mg/Kg	0.017		<0.00060
Vinyl acetate	mg/Kg	80		<0.0010
Vinyl chloride	mg/Kg	0.011		<0.00080
Xylenes, Total	mg/Kg	61		<0.0010

Table 2

**Summary of Soil Samples
Englewood Intermodal Yard - Test Pit Investigation**

Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30 Acre)	SO-1620-TPSoils-2018 1005	SO-1620-TPSoil(2-3)-2018 1005
Semivolatile Organic Compounds (SW8270)				
1,2,4-Trichlorobenzene	mg/Kg	2.4		<0.0012
2,4,5-Trichlorophenol	mg/Kg	51		<0.0025
2,4,6-Trichlorophenol	mg/Kg	0.26		<0.0017
2,4-Dichlorophenol	mg/Kg	0.53		<0.0013
2,4-Dimethylphenol	mg/Kg	4.8		<0.0033
2,4-Dinitrophenol	mg/Kg	0.14		<0.0045
2,4-Dinitrotoluene	mg/Kg	0.006		<0.00089
2,6-Dinitrotoluene	mg/Kg	0.0054		<0.0033
2-Chloronaphthalene	mg/Kg	1000		<0.0013
2-Chlorophenol	mg/Kg	2.4		<0.0013
2-Methylnaphthalene	mg/Kg	25		<0.00050
2-Methylphenol	mg/Kg	11		<0.0011
2-Nitroaniline	mg/Kg	0.033		<0.0019
2-Nitrophenol	mg/Kg	0.2		<0.0025
3&4-Methylphenol	mg/Kg	N/A		<0.00099
3,3'-Dichlorobenzidine	mg/Kg	0.07		<0.0025
3-Nitroaniline	mg/Kg	0.038		<0.0019
4,6-Dinitro-2-methylphenol	mg/Kg	0.007		<0.0021
4-Bromophenyl phenyl ether	mg/Kg	0.4		<0.0016
4-Chloro-3-methylphenol	mg/Kg	6.8		<0.00070
4-Chloroaniline	mg/Kg	0.023		<0.0011
4-Chlorophenyl phenyl ether	mg/Kg	0.036		<0.0015
4-Nitroaniline	mg/Kg	0.12		<0.0022
4-Nitrophenol	mg/Kg	0.15		<0.0019
Acenaphthene	mg/Kg	350		<0.00050
Acenaphthylene	mg/Kg	610		<0.00099
Anthracene	mg/Kg	10000		0.00053 J
Benz(a)anthracene	mg/Kg	150		0.0027 J
Benzidine	mg/Kg	0.000012		<0.0014
Benzo(a)pyrene	mg/Kg	3.8		0.0026 J
Benzo(b)fluoranthene	mg/Kg	170		0.0030 J
Benzo(g,h,i)perylene	mg/Kg	19000		0.0028 J
Benzo(k)fluoranthene	mg/Kg	1700		0.0019 J
Benzyl alcohol	mg/Kg	8.7		<0.00070
Bis(2-chloroethoxy)methane	mg/Kg	0.013		<0.00089
Bis(2-chloroethyl)ether	mg/Kg	0.0024		<0.0011
Bis(2-chloroisopropyl)ether	mg/Kg	0.21		<0.0014
Bis(2-ethylhexyl)phthalate	mg/Kg	82		0.0053 J
Butyl benzyl phthalate	mg/Kg	300		<0.0013
Carbazole	mg/Kg	5.1		<0.0012
Chrysene	mg/Kg	13000		0.0029 J
Di-n-butyl phthalate	mg/Kg	5000		<0.0012
Di-n-octyl phthalate	mg/Kg	6800		<0.00089
Dibenz(a,h)anthracene	mg/Kg	17		<0.0016

Table 2

Summary of Soil Samples
Englewood Intermodal Yard - Test Pit Investigation

Analyte	Units	Tier 1 Commercial/Industrial Soil PCLs (30 Acre)	SO-1620-TPSoils-2018 1005	SO-1620-TPSoil(2-3)-2018 1005
Dibenzofuran	mg/Kg	50		<0.00070
Diethyl phthalate	mg/Kg	230		<0.00099
Dimethyl phthalate	mg/Kg	93		<0.00080
Fluoranthene	mg/Kg	2900		0.0043
Fluorene	mg/Kg	450		<0.0011
Hexachlorobenzene	mg/Kg	0.56		<0.00089
Hexachlorobutadiene	mg/Kg	3.7		<0.0012
Hexachlorocyclopentadiene	mg/Kg	9.6		<0.00080
Hexachloroethane	mg/Kg	1.9		<0.0015
Indeno(1,2,3-cd)pyrene	mg/Kg	170		0.0022 J
Isophorone	mg/Kg	3.4		<0.00080
N-Nitrosodi-n-propylamine	mg/Kg	0.00039		<0.0011
N-Nitrosodimethylamine	mg/Kg	0.000041		<0.0012
N-Nitrosodiphenylamine	mg/Kg	3.2		<0.00070
Naphthalene	mg/Kg	47		<0.00060
Nitrobenzene	mg/Kg	0.52		<0.00089
Pentachlorophenol	mg/Kg	0.0092		<0.0033
Phenanthrene	mg/Kg	620		0.0022 J
Phenol	mg/Kg	29		<0.0011
Pyrene	mg/Kg	1700		0.0038
Total Petroleum Hydrocarbons (TX1005)				
nC6 to nC12	mg/Kg	97	<36	<7.2
>nC12 to nC28	mg/Kg	300	1,600	<9.4
>nC28 to nC35	mg/Kg	300	370	<9.4
Total Petroleum Hydrocarbon	mg/Kg	N/A	2,000	<7.2

Notes: Soil PCLs - Tier 1 Commercial/Industrial PCLs listed are based on the lowest of ^{Tot}Soil_{Comb}, ^{GW}Soil_{Ing} for a 30-acre source area. Last updated April 27, 2018. Texas-Specific Background Concentrations (mg/kg) replace the PCL for metals where background concentration is greater than commercial/industrial PCLs.

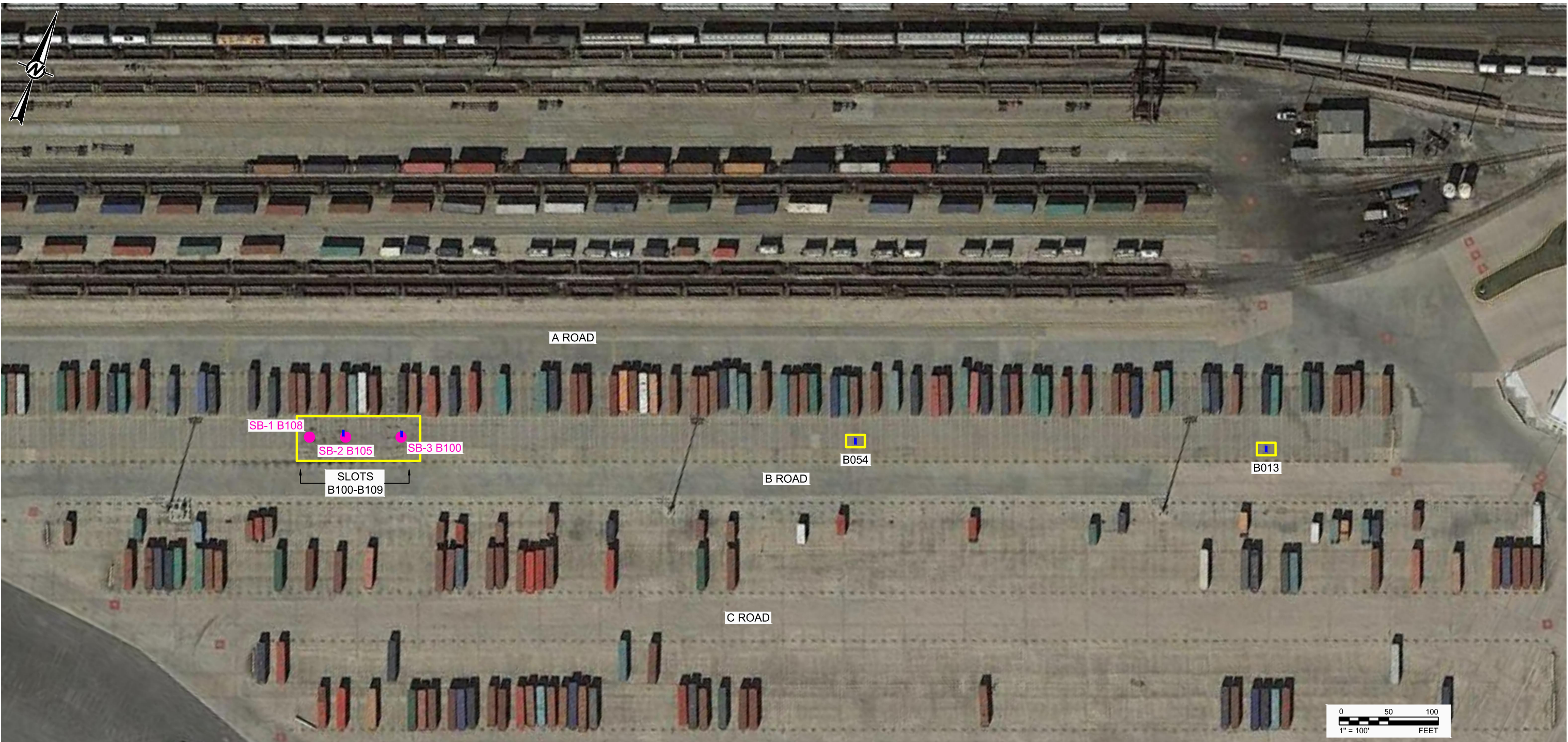
Results with a "<" indicate that the analyte was analyzed but not detected above the Method Detection Limit (MDL).

Results with a "J" flag indicate that the analyte was detected above the MDL but below the quantitation limit.

Concentrations >PCL and >MDL are highlighted.

* TCLP Regulatory Levels according to 40 CFR Section 261.24.

Figures



**PRELIMINARY DESIGN
NOT FOR
CONSTRUCTION**

- LEGEND**
- TEST PIT LOCATIONS (6'L x 2'W x 5'D)
 - ENVIRONMENTAL SAMPLE BORING LOCATIONS (PBW, 2018)
 - AFFECTED AREA (TAR-LIKE SUBSTANCE SURFACING THROUGH SOME CRACKS AND JOINTS)

REFERENCE(S)
BASE MAP TAKEN FROM GOOGLE EARTH IMAGE DATED 01-23-2017.

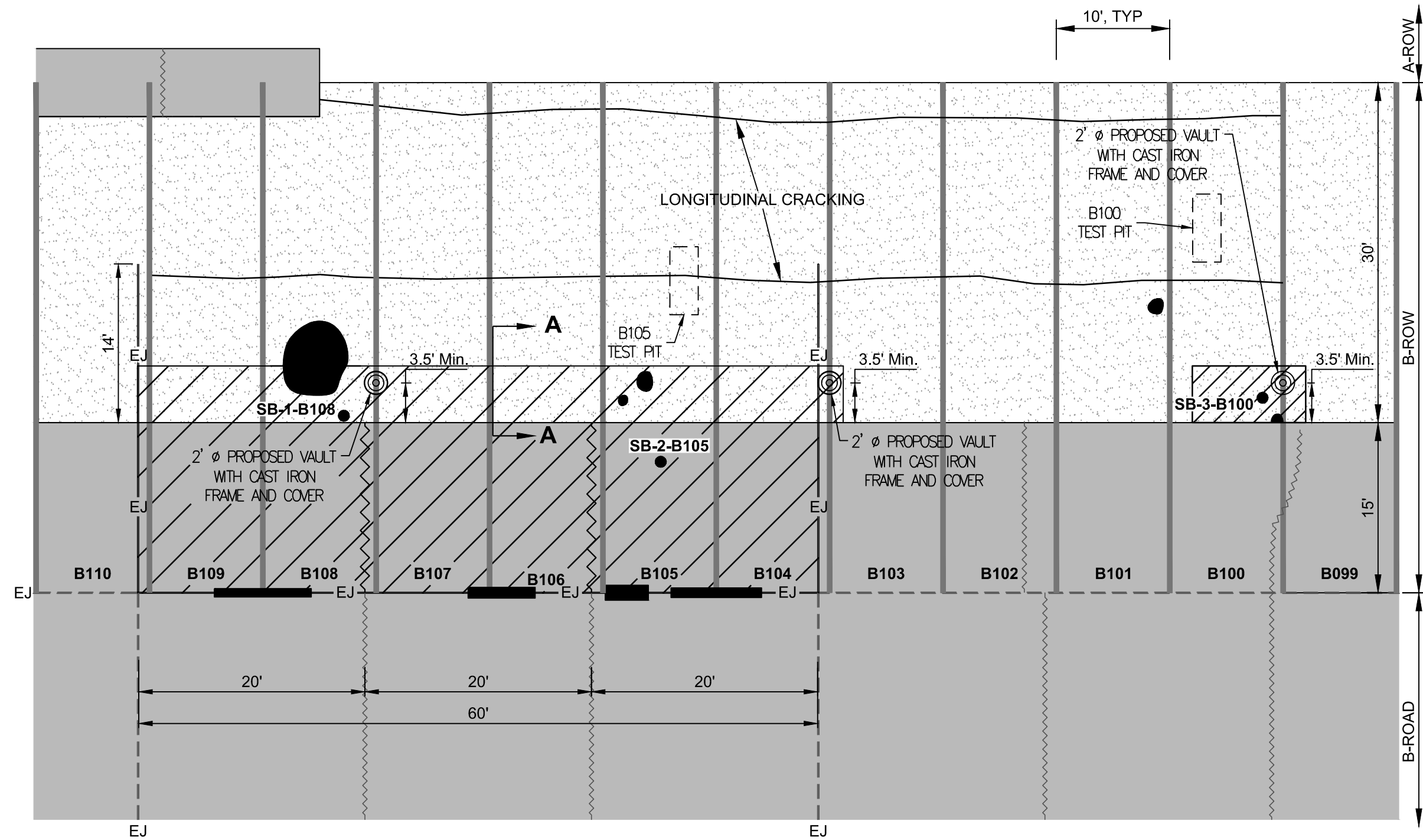
CLIENT
UNION PACIFIC RAILROAD CO.

PROJECT
ENGLEWOOD INTERMODAL YARD - SEEP INVESTIGATION













TITLE
SITE MAP

CONSULTANT	YYYY-MM-DD	2018-08-31
GOLDER	DESIGNED	BZH
	PREPARED	BZH
	REVIEWED	RBL
	APPROVED	ECM

PROJECT NO. 30401358-640	REV. 0	FIGURE 1
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LEGEND

-  REINFORCED CONCRETE PAVEMENT
-  ASPHALT PAVEMENT/ROAD BASE
-  PARKING STALL YELLOW LINE (4" WIDE)
-  EXISTING SEEP LOCATION
-  PROPOSED AREA OF EXCAVATION
-  EXISTING EXPANSION/CONSTRUCTION JOINT
-  PROPOSED EXPANSION/CONSTRUCTION JOINT
-  == EJ == EXISTING CONTRACTION/CONTROL JOINT
-  = EJ = PROPOSED CONTRACTION/CONTROL JOINT
-  PROPOSED NAPL COLLECTION VAULT (2')
-  SOIL BORING LOCATION
-  TEST PIT (6' L x 2.5' W x 5' D)

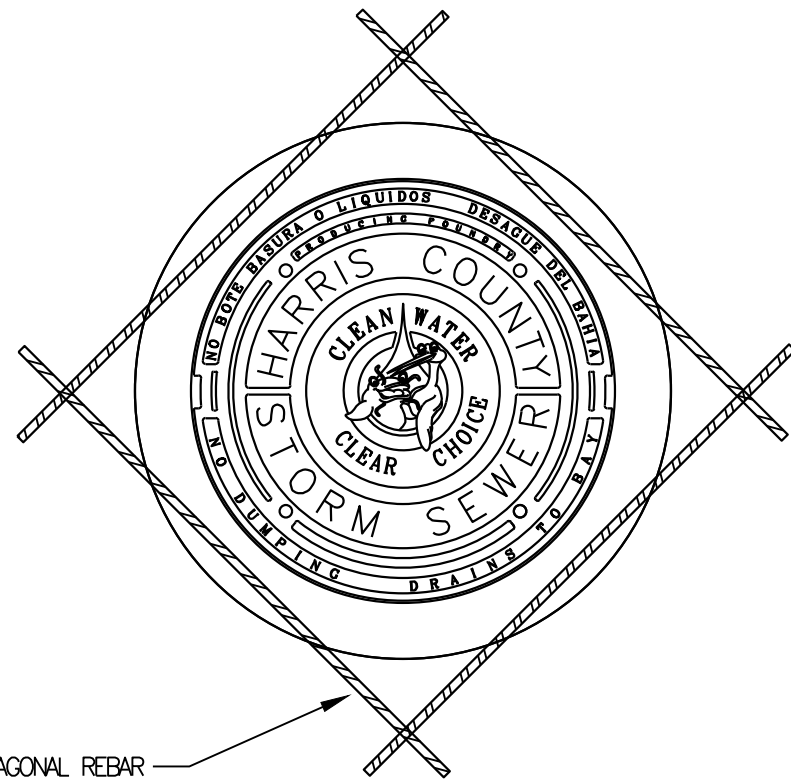
**PRELIMINARY DESIGN
NOT FOR
CONSTRUCTION**

CLIENT
UNION PACIFIC RAILROAD CO. 

PROJECT
ENGLEWOOD INTERMODAL YARD - SEEP INVESTIGATION

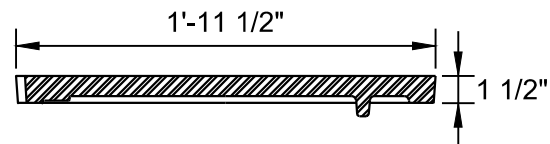
TITLE
PROPOSED REMEDIAL EXCAVATION

CONSULTANT	YYYY-MM-DD	2018-10-31
	DESIGNED	BZH
	PREPARED	BZH
	REVIEWED	RBL/ECM
	APPROVED	RBL/ECM

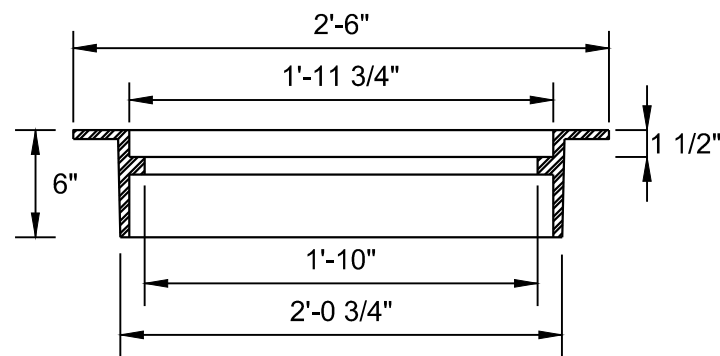


DIAGONAL REBAR
REQUIRED AT OPENING
(1 #6 TOP & BOTTOM)

COVER AND FRAME PLAN VIEW

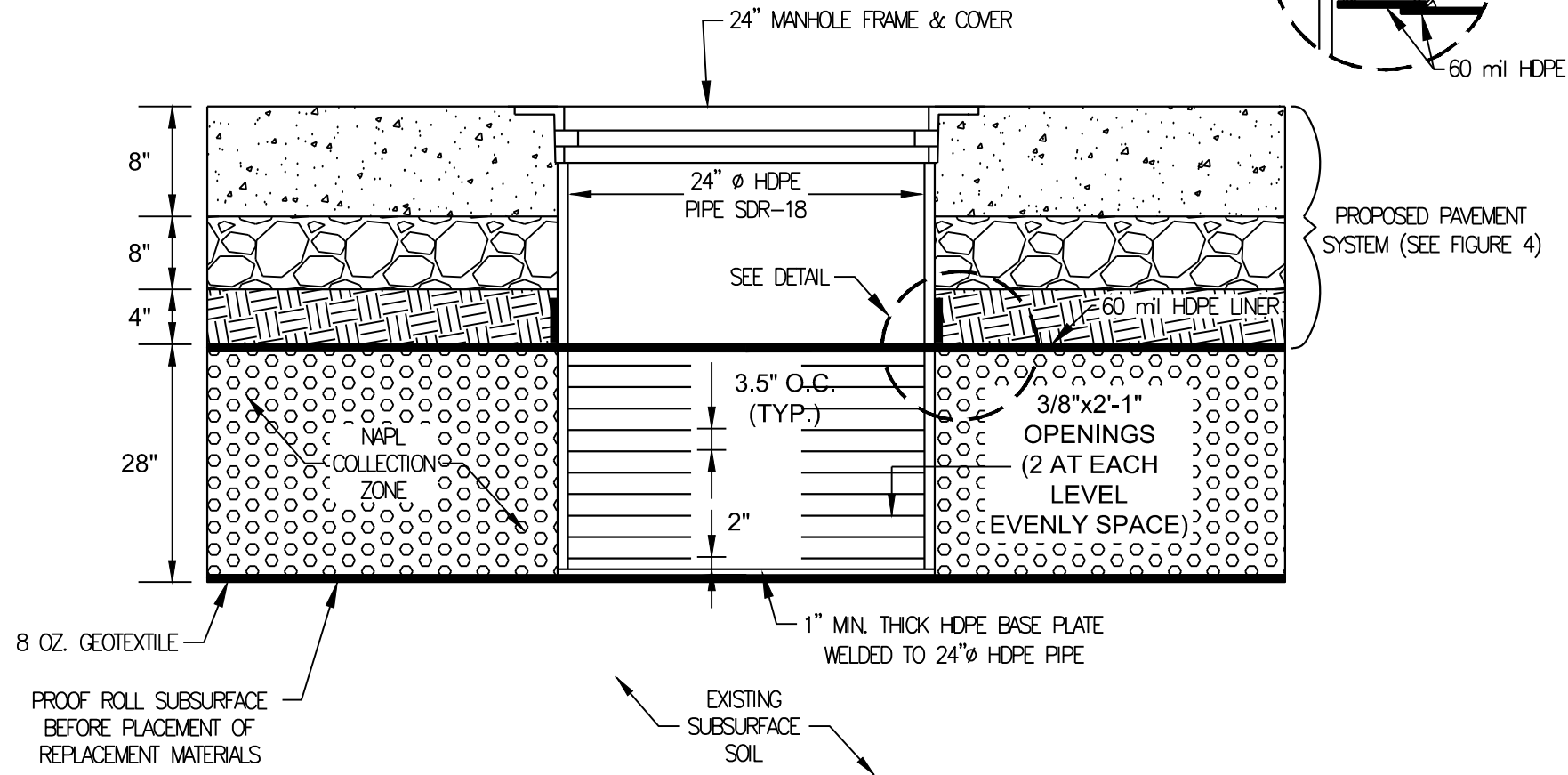
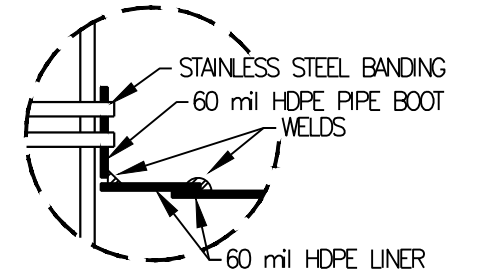


COVER SECTION A-A







FRAME SECTION A-A

**PRELIMINARY DESIGN
NOT FOR
CONSTRUCTION**



NOTE:

1. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS MODEL V-1814 FRAME AND V-1418 COVER OR APPROVED EQUAL.

-  HMAC
-  COMPACTED BASE MATERIAL (TXDOT GRADE 1 AGGREGATE)
-  COMPACTED SELECT FILL
-  COMPACTED HIGH PERMEABILITY FILL (3/4" - 1" ANGULAR GRAVEL)

**SECTION A-A
N.T.S.**

CLIENT
UNION PACIFIC RAILROAD CO. 

PROJECT
ENGLEWOOD INTERMODAL YARD - SEEP INVESTIGATION

TITLE
PROPOSED NAPL COLLECTION SYSTEM

CONSULTANT	YYYY-MM-DD	2018-10-31
	DESIGNED	BZH
	PREPARED	BZH
	REVIEWED	RBL/ECM
	APPROVED	RBL/ECM

PROJECT NO. 30401358-640 REV. 0 FIGURE 3

ATTACHMENT A

Test Pit Photographs



Client Name:
Union Pacific Railroad

Site Location:
Englewood Intermodal Yard/Houston Wood Preserving
Works, 4910 Liberty Road, Houston, Texas

Project No.
30401358

Photo No.
1

Date:
10/04/18

Description:

Test Pit B13:

View of test pit B13,
note debris in pit,
looking northwest.

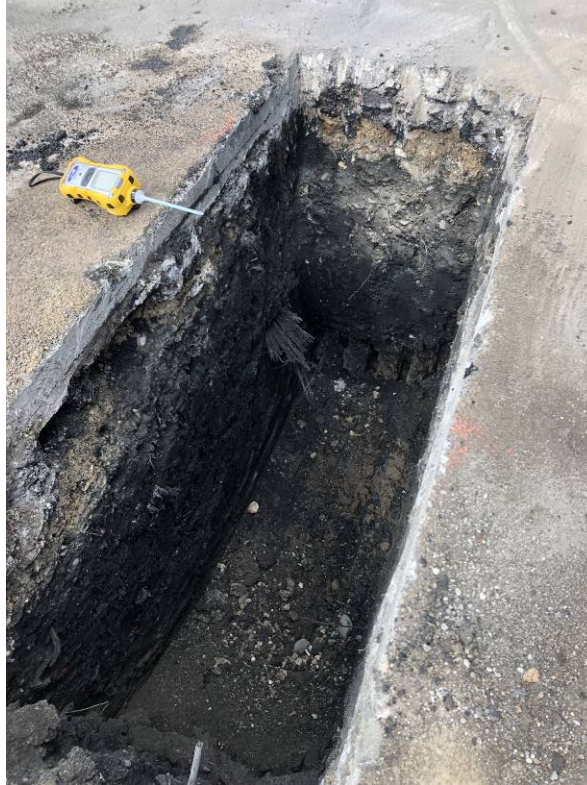


Photo No.
2

Date:
10/05/18

Description:

Test Pit B54:

View of test pit B54,
note light colored clay
overlying tar seep,
looking southwest.





Client Name:
Union Pacific Railroad

Site Location:
 Englewood Intermodal Yard/Houston Wood Preserving
 Works, 4910 Liberty Road, Houston, Texas

Project No.
 30401358

Photo No.
3

Date:
 10/04/18

Description:

Test Pit B100:

View of test pit B100,
 looking north, note
 NAPL material seeping
 in around 3 feet bgs.



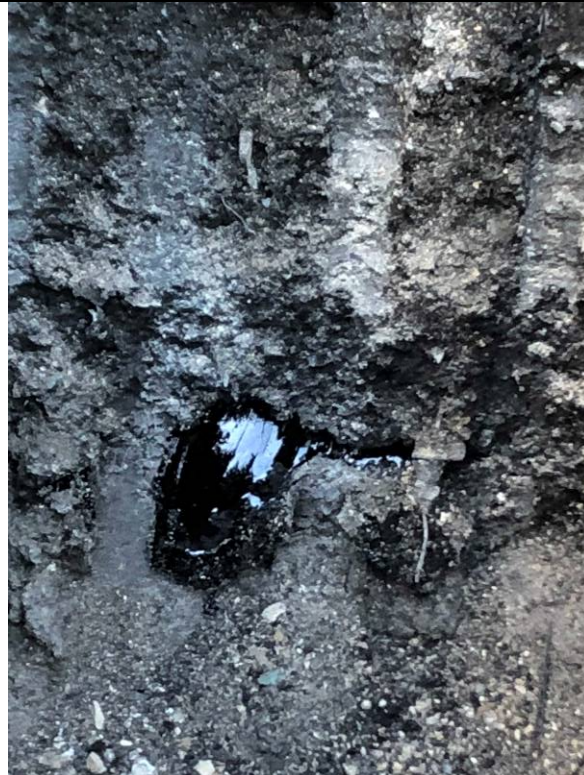
Photo No.
4

Date:
 10/04/18

Description:

Test Pit B100:

View of test pit B100,
 looking into the west
 wall, note NAPL
 material seeping in
 around 3 feet bgs.





Client Name:
Union Pacific Railroad

Site Location:
 Englewood Intermodal Yard/Houston Wood Preserving
 Works, 4910 Liberty Road, Houston, Texas

Project No.
 30401358

Photo No.
5

Date:
 10/05/18

Description:

Test Pit B105:
 View of test pit B105,
 looking into the north,
 note NAPL material
 seeping in around 2
 feet bgs.



Photo No.

Date:

Description:

ATTACHMENT B

Test Pit Laboratory Analytical Reports



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

October 17, 2018

Eric Matzner
Golder Associates Inc.
2201 Double Creek Drive
Suite 4004
Round Rock, TX 78664

Work Order: **HS18100316**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 2 sample(s) on Oct 05, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100316

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100316-01	SO-1620-TPSoils-20181005	Soil		05-Oct-2018 10:30	05-Oct-2018 16:11	<input type="checkbox"/>
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	Soil		05-Oct-2018 08:00	05-Oct-2018 16:11	<input type="checkbox"/>

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100316

CASE NARRATIVE

Work Order Comments

- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.

GC Semivolatiles by Method TX1005**Batch ID: 133213****Sample ID: HS18100277-01MS**

- MS and MSD are for an unrelated sample (>nC12 to nC28)

GCMS Semivolatiles by Method SW8270**Batch ID: 133277****Sample ID: HS18100214-08MSD**

- MSD is for an unrelated sample

Batch ID: 133315

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260**Batch ID: R325399****Sample ID: HS18100636-21MS**

- MS and MSD are for an unrelated sample

Sample ID: SO-1620-TPSoil(2-3)-20181005 (HS18100316-02)

- Surrogate failure for HS1810316-02 due to sample matrix.

Sample ID: VSTD050

- Bromomethane high on CCV, associated samples ND. LCS ok.

GCMS Volatiles by Method SW1311/8260B**Batch ID: 133269****Sample ID: VLCSW-133269 100818**

- 1,4-Dichlorobenzene exceeded QC limits for LCS. CCV is OK.

Sample ID: HS18100597-01MS

- MS is for an unrelated sample.

Metals by Method SW1311/6020**Batch ID: 133321**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100316

CASE NARRATIVE

Metals by Method SW7470

Batch ID: 133347

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Metals by Method SW7471A

Batch ID: 133275

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Metals by Method SW6020

Batch ID: 133187

Sample ID: HS18100284-01MS

- MS/MSD and DUPs are for an unrelated sample
-

WetChemistry by Method SW1030

Batch ID: R325139

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW9045B

Batch ID: R325118

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW7.3.3.2

Batch ID: R325039

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW7.3.4.2

Batch ID: R325036

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoils-20181005
 Collection Date: 05-Oct-2018 10:30

ANALYTICAL REPORT
 WorkOrder:HS18100316
 Lab ID:HS18100316-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP VOLATILES							
		Method:SW1311/8260B		Leache:SW1311 / 09-Oct-2018	Prep:SW1311 / 09-Oct-2018		Analyst: PC
1,1-Dichloroethene	< 0.010		0.010	0.10	mg/L	20	11-Oct-2018 05:34
1,2-Dichloroethane	< 0.010		0.010	0.10	mg/L	20	11-Oct-2018 05:34
1,4-Dichlorobenzene	< 0.012		0.012	0.10	mg/L	20	11-Oct-2018 05:34
2-Butanone	< 0.020		0.020	0.20	mg/L	20	11-Oct-2018 05:34
Benzene	< 0.012		0.012	0.10	mg/L	20	11-Oct-2018 05:34
Carbon tetrachloride	< 0.012		0.012	0.10	mg/L	20	11-Oct-2018 05:34
Chlorobenzene	< 0.0080		0.0080	0.10	mg/L	20	11-Oct-2018 05:34
Chloroform	< 0.012		0.012	0.10	mg/L	20	11-Oct-2018 05:34
Tetrachloroethene	< 0.012		0.012	0.10	mg/L	20	11-Oct-2018 05:34
Trichloroethene	< 0.010		0.010	0.10	mg/L	20	11-Oct-2018 05:34
Vinyl chloride	< 0.0080		0.0080	0.040	mg/L	20	11-Oct-2018 05:34
<i>Surr: 1,2-Dichloroethane-d4</i>	90.9			70-126	%REC	20	11-Oct-2018 05:34
<i>Surr: 4-Bromofluorobenzene</i>	92.8			82-124	%REC	20	11-Oct-2018 05:34
<i>Surr: Dibromofluoromethane</i>	87.0			77-123	%REC	20	11-Oct-2018 05:34
<i>Surr: Toluene-d8</i>	107			82-127	%REC	20	11-Oct-2018 05:34
TCLP SEMIVOLATILES							
		Method:SW1311/8270		Leache:SW1311 / 09-Oct-2018	Prep:SW3510 / 09-Oct-2018		Analyst: GEY
2,4,5-Trichlorophenol	< 0.00092		0.00092	0.0051	mg/L	1	10-Oct-2018 11:32
2,4,6-Trichlorophenol	< 0.0014		0.0014	0.0051	mg/L	1	10-Oct-2018 11:32
2,4-Dinitrotoluene	< 0.0010		0.0010	0.0051	mg/L	1	10-Oct-2018 11:32
Cresols, Total	< 0.0020		0.0020	0.015	mg/L	1	10-Oct-2018 11:32
Hexachlorobenzene	< 0.0011		0.0011	0.0051	mg/L	1	10-Oct-2018 11:32
Hexachlorobutadiene	< 0.0011		0.0011	0.0051	mg/L	1	10-Oct-2018 11:32
Hexachloroethane	< 0.0010		0.0010	0.0051	mg/L	1	10-Oct-2018 11:32
Nitrobenzene	< 0.00082		0.00082	0.0051	mg/L	1	10-Oct-2018 11:32
Pentachlorophenol	< 0.0016		0.0016	0.0051	mg/L	1	10-Oct-2018 11:32
Pyridine	< 0.0020		0.0020	0.0051	mg/L	1	10-Oct-2018 11:32
<i>Surr: 2,4,6-Tribromophenol</i>	85.2			39-153	%REC	1	10-Oct-2018 11:32
<i>Surr: 2-Fluorobiphenyl</i>	61.7			40-147	%REC	1	10-Oct-2018 11:32
<i>Surr: 2-Fluorophenol</i>	61.1			21-110	%REC	1	10-Oct-2018 11:32
<i>Surr: 4-Terphenyl-d14</i>	81.4			39-141	%REC	1	10-Oct-2018 11:32
<i>Surr: Nitrobenzene-d5</i>	67.3			37-140	%REC	1	10-Oct-2018 11:32
<i>Surr: Phenol-d6</i>	71.8			11-110	%REC	1	10-Oct-2018 11:32
TEXAS TPH BY TX1005							
		Method:TX1005		Prep:TX1005PR / 05-Oct-2018		Analyst: MBG	
nC6 to nC12	< 36		36	250	mg/Kg	5	09-Oct-2018 01:30
>nC12 to nC28	1,600		48	250	mg/Kg	5	09-Oct-2018 01:30
>nC28 to nC35	370		48	250	mg/Kg	5	09-Oct-2018 01:30
Total Petroleum Hydrocarbon	1,970		36	250	mg/Kg	5	09-Oct-2018 01:30
<i>Surr: 2-Fluorobiphenyl</i>	105			70-130	%REC	5	09-Oct-2018 01:30
<i>Surr: Trifluoromethyl benzene</i>	108			70-130	%REC	5	09-Oct-2018 01:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoils-20181005
 Collection Date: 05-Oct-2018 10:30

ANALYTICAL REPORT
 WorkOrder:HS18100316
 Lab ID:HS18100316-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TCLP METALS BY SW6020A		Method:SW1311/6020		Leache:SW1311 / 09-Oct-2018	Prep:SW3010A / 09-Oct-2018		Analyst: JDE
Arsenic	0.00727	J	0.00400	0.0500	mg/L	1	10-Oct-2018 16:47
Barium	2.10		0.0190	0.200	mg/L	1	10-Oct-2018 16:47
Cadmium	0.0265	J	0.00200	0.0500	mg/L	1	10-Oct-2018 16:47
Chromium	< 0.00400		0.00400	0.0500	mg/L	1	10-Oct-2018 16:47
Lead	0.420		0.00600	0.0500	mg/L	1	10-Oct-2018 16:47
Selenium	< 0.0110		0.0110	0.0500	mg/L	1	10-Oct-2018 16:47
Silver	< 0.00200		0.00200	0.0500	mg/L	1	10-Oct-2018 16:47
TCLP MERCURY BY SW7470A		Method:SW7470		Leache:SW1311 / 09-Oct-2018	Prep:SW7470 / 10-Oct-2018		Analyst: JCJ
Mercury	< 0.0000300		0.0000300	0.000200	mg/L	1	10-Oct-2018 15:08
BURN RATE BY METHOD SW1030		Method:SW1030					Analyst: KAH
Ignitability, Solid	Negative		0	0	Burn Rate, mm/sec	1	10-Oct-2018 15:00
REACTIVE CYANIDE		Method:SW7.3.3.2			Prep:SW7.3.3.2		Analyst: MZD
Reactive Cyanide	< 100	n	100	100	mg/Kg	1	09-Oct-2018 14:15
REACTIVE SULFIDE		Method:SW7.3.4.2					Analyst: MZD
Reactive Sulfide	< 100	n	100	100	mg/Kg	1	09-Oct-2018 13:45
PH SOIL BY SW9045D		Method:SW9045B					Analyst: MZD
pH	8.57	H	0.100	0.100	pH Units	1	10-Oct-2018 13:15
Temp Deg C @pH	21.1	H	0	0	°C	1	10-Oct-2018 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoil(2-3)-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100316
 Lab ID:HS18100316-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
1,1,1-Trichloroethane	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,1,2,2-Tetrachloroethane	< 0.00080		0.00080	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,1,2-Trichloroethane	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,1-Dichloroethane	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,1-Dichloroethene	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,2-Dichlorobenzene	< 0.0010		0.0010	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,2-Dichloroethane	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,2-Dichloropropane	< 0.00080		0.00080	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,3-Dichlorobenzene	< 0.0010		0.0010	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,4-Dichlorobenzene	< 0.0010		0.0010	0.0050	mg/Kg	1	15-Oct-2018 11:58
2-Butanone	< 0.0013		0.0013	0.010	mg/Kg	1	15-Oct-2018 11:58
2-Hexanone	< 0.0014		0.0014	0.010	mg/Kg	1	15-Oct-2018 11:58
4-Methyl-2-pentanone	< 0.0020		0.0020	0.010	mg/Kg	1	15-Oct-2018 11:58
Acetone	0.085		0.0020	0.020	mg/Kg	1	15-Oct-2018 11:58
Benzene	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
Bromochloromethane	< 0.00090		0.00090	0.0050	mg/Kg	1	15-Oct-2018 11:58
Bromodichloromethane	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
Bromoform	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
Bromomethane	< 0.0010		0.0010	0.010	mg/Kg	1	15-Oct-2018 11:58
Carbon disulfide	< 0.00060		0.00060	0.010	mg/Kg	1	15-Oct-2018 11:58
Carbon tetrachloride	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
Chlorobenzene	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
Chloroethane	< 0.00080		0.00080	0.010	mg/Kg	1	15-Oct-2018 11:58
Chloroform	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
Chloromethane	< 0.00050		0.00050	0.010	mg/Kg	1	15-Oct-2018 11:58
cis-1,2-Dichloroethene	< 0.00080		0.00080	0.0050	mg/Kg	1	15-Oct-2018 11:58
cis-1,3-Dichloropropene	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
Dibromochloromethane	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
Ethylbenzene	< 0.00070		0.00070	0.0050	mg/Kg	1	15-Oct-2018 11:58
m,p-Xylene	< 0.0016		0.0016	0.010	mg/Kg	1	15-Oct-2018 11:58
Methylene chloride	< 0.0010		0.0010	0.010	mg/Kg	1	15-Oct-2018 11:58
o-Xylene	< 0.0010		0.0010	0.0050	mg/Kg	1	15-Oct-2018 11:58
Styrene	< 0.00070		0.00070	0.0050	mg/Kg	1	15-Oct-2018 11:58
Tetrachloroethene	< 0.00070		0.00070	0.0050	mg/Kg	1	15-Oct-2018 11:58
Toluene	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
trans-1,2-Dichloroethene	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
trans-1,3-Dichloropropene	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
Trichloroethene	< 0.00060		0.00060	0.0050	mg/Kg	1	15-Oct-2018 11:58
Vinyl acetate	< 0.0010		0.0010	0.010	mg/Kg	1	15-Oct-2018 11:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoil(2-3)-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100316
 Lab ID:HS18100316-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
Vinyl chloride	< 0.00080		0.00080	0.0020	mg/Kg	1	15-Oct-2018 11:58
Xylenes, Total	< 0.0010		0.0010	0.0050	mg/Kg	1	15-Oct-2018 11:58
1,2-Dichloroethene, Total	< 0.00050		0.00050	0.0050	mg/Kg	1	15-Oct-2018 11:58
Surr: 1,2-Dichloroethane-d4	84.4			70-126	%REC	1	15-Oct-2018 11:58
Surr: 4-Bromofluorobenzene	97.7			70-130	%REC	1	15-Oct-2018 11:58
Surr: Dibromofluoromethane	31.8	S		70-130	%REC	1	15-Oct-2018 11:58
Surr: Toluene-d8	104			70-130	%REC	1	15-Oct-2018 11:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoil(2-3)-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100316
 Lab ID:HS18100316-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270		Prep:SW3541 / 08-Oct-2018		Analyst: GEY	
1,2,4-Trichlorobenzene	< 0.0012		0.0012	0.0066	mg/Kg	1	09-Oct-2018 13:04
2,4,5-Trichlorophenol	< 0.0025		0.0025	0.0066	mg/Kg	1	09-Oct-2018 13:04
2,4,6-Trichlorophenol	< 0.0017		0.0017	0.0066	mg/Kg	1	09-Oct-2018 13:04
2,4-Dichlorophenol	< 0.0013		0.0013	0.0066	mg/Kg	1	09-Oct-2018 13:04
2,4-Dimethylphenol	< 0.0033		0.0033	0.0066	mg/Kg	1	09-Oct-2018 13:04
2,4-Dinitrophenol	< 0.0045		0.0045	0.013	mg/Kg	1	09-Oct-2018 13:04
2,4-Dinitrotoluene	< 0.00089		0.00089	0.0066	mg/Kg	1	09-Oct-2018 13:04
2,6-Dinitrotoluene	< 0.0033		0.0033	0.0066	mg/Kg	1	09-Oct-2018 13:04
2-Chloronaphthalene	< 0.0013		0.0013	0.0066	mg/Kg	1	09-Oct-2018 13:04
2-Chlorophenol	< 0.0013		0.0013	0.0066	mg/Kg	1	09-Oct-2018 13:04
2-Methylnaphthalene	< 0.00050		0.00050	0.0033	mg/Kg	1	09-Oct-2018 13:04
2-Methylphenol	< 0.0011		0.0011	0.0066	mg/Kg	1	09-Oct-2018 13:04
2-Nitroaniline	< 0.0019		0.0019	0.0066	mg/Kg	1	09-Oct-2018 13:04
2-Nitrophenol	< 0.0025		0.0025	0.0066	mg/Kg	1	09-Oct-2018 13:04
3&4-Methylphenol	< 0.00099		0.00099	0.0066	mg/Kg	1	09-Oct-2018 13:04
3,3'-Dichlorobenzidine	< 0.0025		0.0025	0.0066	mg/Kg	1	09-Oct-2018 13:04
3-Nitroaniline	< 0.0019		0.0019	0.0066	mg/Kg	1	09-Oct-2018 13:04
4,6-Dinitro-2-methylphenol	< 0.0021		0.0021	0.0066	mg/Kg	1	09-Oct-2018 13:04
4-Bromophenyl phenyl ether	< 0.0016		0.0016	0.0066	mg/Kg	1	09-Oct-2018 13:04
4-Chloro-3-methylphenol	< 0.00070		0.00070	0.0066	mg/Kg	1	09-Oct-2018 13:04
4-Chloroaniline	< 0.0011		0.0011	0.0066	mg/Kg	1	09-Oct-2018 13:04
4-Chlorophenyl phenyl ether	< 0.0015		0.0015	0.0066	mg/Kg	1	09-Oct-2018 13:04
4-Nitroaniline	< 0.0022		0.0022	0.0066	mg/Kg	1	09-Oct-2018 13:04
4-Nitrophenol	< 0.0019		0.0019	0.013	mg/Kg	1	09-Oct-2018 13:04
Acenaphthene	< 0.00050		0.00050	0.0033	mg/Kg	1	09-Oct-2018 13:04
Acenaphthylene	< 0.00099		0.00099	0.0033	mg/Kg	1	09-Oct-2018 13:04
Anthracene	0.00053	J	0.00050	0.0033	mg/Kg	1	09-Oct-2018 13:04
Benzo(a)anthracene	0.0027	J	0.0016	0.0033	mg/Kg	1	09-Oct-2018 13:04
Benzidine	< 0.0014		0.0014	0.0066	mg/Kg	1	09-Oct-2018 13:04
Benzo(a)pyrene	0.0026	J	0.00099	0.0033	mg/Kg	1	09-Oct-2018 13:04
Benzo(b)fluoranthene	0.0030	J	0.0012	0.0033	mg/Kg	1	09-Oct-2018 13:04
Benzo(g,h,i)perylene	0.0028	J	0.00070	0.0033	mg/Kg	1	09-Oct-2018 13:04
Benzo(k)fluoranthene	0.0019	J	0.00089	0.0033	mg/Kg	1	09-Oct-2018 13:04
Benzyl alcohol	< 0.00070		0.00070	0.0066	mg/Kg	1	09-Oct-2018 13:04
Bis(2-chloro-1-methylethyl) ether	< 0.0014		0.0014	0.0066	mg/Kg	1	09-Oct-2018 13:04
Bis(2-chloroethoxy)methane	< 0.00089		0.00089	0.0066	mg/Kg	1	09-Oct-2018 13:04
Bis(2-chloroethyl)ether	< 0.0011		0.0011	0.0066	mg/Kg	1	09-Oct-2018 13:04
Bis(2-ethylhexyl)phthalate	0.0053	J	0.0017	0.0066	mg/Kg	1	09-Oct-2018 13:04
Butyl benzyl phthalate	< 0.0013		0.0013	0.0066	mg/Kg	1	09-Oct-2018 13:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoil(2-3)-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100316
 Lab ID:HS18100316-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D			Method:SW8270		Prep:SW3541 / 08-Oct-2018		Analyst: GEY
Carbazole	< 0.0012		0.0012	0.0066	mg/Kg	1	09-Oct-2018 13:04
Chrysene	0.0029	J	0.00080	0.0033	mg/Kg	1	09-Oct-2018 13:04
Dibenz(a,h)anthracene	< 0.0016		0.0016	0.0033	mg/Kg	1	09-Oct-2018 13:04
Dibenzofuran	< 0.00070		0.00070	0.0033	mg/Kg	1	09-Oct-2018 13:04
Diethyl phthalate	< 0.00099		0.00099	0.0066	mg/Kg	1	09-Oct-2018 13:04
Dimethyl phthalate	< 0.00080		0.00080	0.0066	mg/Kg	1	09-Oct-2018 13:04
Di-n-butyl phthalate	< 0.0012		0.0012	0.0066	mg/Kg	1	09-Oct-2018 13:04
Di-n-octyl phthalate	< 0.00089		0.00089	0.0066	mg/Kg	1	09-Oct-2018 13:04
Fluoranthene	0.0043		0.0011	0.0033	mg/Kg	1	09-Oct-2018 13:04
Fluorene	< 0.0011		0.0011	0.0033	mg/Kg	1	09-Oct-2018 13:04
Hexachlorobenzene	< 0.00089		0.00089	0.0066	mg/Kg	1	09-Oct-2018 13:04
Hexachlorobutadiene	< 0.0012		0.0012	0.0066	mg/Kg	1	09-Oct-2018 13:04
Hexachlorocyclopentadiene	< 0.00080		0.00080	0.0066	mg/Kg	1	09-Oct-2018 13:04
Hexachloroethane	< 0.0015		0.0015	0.0066	mg/Kg	1	09-Oct-2018 13:04
Indeno(1,2,3-cd)pyrene	0.0022	J	0.00080	0.0033	mg/Kg	1	09-Oct-2018 13:04
Isophorone	< 0.00080		0.00080	0.0066	mg/Kg	1	09-Oct-2018 13:04
Naphthalene	< 0.00060		0.00060	0.0033	mg/Kg	1	09-Oct-2018 13:04
Nitrobenzene	< 0.00089		0.00089	0.0066	mg/Kg	1	09-Oct-2018 13:04
N-Nitrosodimethylamine	< 0.0012		0.0012	0.0066	mg/Kg	1	09-Oct-2018 13:04
N-Nitrosodi-n-propylamine	< 0.0011		0.0011	0.0066	mg/Kg	1	09-Oct-2018 13:04
N-Nitrosodiphenylamine	< 0.00070		0.00070	0.0066	mg/Kg	1	09-Oct-2018 13:04
Pentachlorophenol	< 0.0033		0.0033	0.0066	mg/Kg	1	09-Oct-2018 13:04
Phenanthrene	0.0022	J	0.0015	0.0033	mg/Kg	1	09-Oct-2018 13:04
Phenol	< 0.0011		0.0011	0.0066	mg/Kg	1	09-Oct-2018 13:04
Pyrene	0.0038		0.00060	0.0033	mg/Kg	1	09-Oct-2018 13:04
<i>Surr: 2,4,6-Tribromophenol</i>	79.8			36-126	%REC	1	09-Oct-2018 13:04
<i>Surr: 2-Fluorobiphenyl</i>	81.7			43-125	%REC	1	09-Oct-2018 13:04
<i>Surr: 2-Fluorophenol</i>	59.2			37-125	%REC	1	09-Oct-2018 13:04
<i>Surr: 4-Terphenyl-d14</i>	99.7			32-125	%REC	1	09-Oct-2018 13:04
<i>Surr: Nitrobenzene-d5</i>	67.6			37-125	%REC	1	09-Oct-2018 13:04
<i>Surr: Phenol-d6</i>	70.4			40-125	%REC	1	09-Oct-2018 13:04
TEXAS TPH BY TX1005			Method:TX1005		Prep:TX1005PR / 05-Oct-2018		Analyst: MBG
nC6 to nC12	< 7.2		7.2	48	mg/Kg	1	09-Oct-2018 02:00
>nC12 to nC28	< 9.4		9.4	48	mg/Kg	1	09-Oct-2018 02:00
>nC28 to nC35	< 9.4		9.4	48	mg/Kg	1	09-Oct-2018 02:00
Total Petroleum Hydrocarbon	< 7.2		7.2	48	mg/Kg	1	09-Oct-2018 02:00
<i>Surr: 2-Fluorobiphenyl</i>	112			70-130	%REC	1	09-Oct-2018 02:00
<i>Surr: Trifluoromethyl benzene</i>	115			70-130	%REC	1	09-Oct-2018 02:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: SO-1620-TPSoil(2-3)-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100316
 Lab ID:HS18100316-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020			Prep:SW3050A / 05-Oct-2018		Analyst: JC
Arsenic	1.17		0.0664	0.474	mg/Kg	1	11-Oct-2018 12:28
Barium	9.20		0.0285	0.474	mg/Kg	1	10-Oct-2018 00:24
Cadmium	0.162	J	0.0256	0.474	mg/Kg	1	10-Oct-2018 00:24
Chromium	1.91		0.0218	0.474	mg/Kg	1	10-Oct-2018 00:24
Lead	10.4		0.0123	0.474	mg/Kg	1	10-Oct-2018 00:24
Selenium	0.462	J	0.0863	0.474	mg/Kg	1	10-Oct-2018 00:24
Silver	0.0317	J	0.0142	0.474	mg/Kg	1	10-Oct-2018 00:24
MERCURY BY SW7471B		Method:SW7471A			Prep:SW7471A / 08-Oct-2018		Analyst: JCJ
Mercury	0.00318	J	0.000498	0.00353	mg/Kg	1	09-Oct-2018 16:34
BURN RATE BY METHOD SW1030		Method:SW1030					Analyst: KAH
Ignitability, Solid	Negative		0	0	Burn Rate, mm/sec	1	10-Oct-2018 15:00
REACTIVE CYANIDE		Method:SW7.3.3.2			Prep:SW7.3.3.2		Analyst: MZD
Reactive Cyanide	< 100	n	100	100	mg/Kg	1	09-Oct-2018 14:15
REACTIVE SULFIDE		Method:SW7.3.4.2					Analyst: MZD
Reactive Sulfide	< 100	n	100	100	mg/Kg	1	09-Oct-2018 13:45
PH SOIL BY SW9045D		Method:SW9045B					Analyst: MZD
pH	11.3	H	0.100	0.100	pH Units	1	10-Oct-2018 13:15
Temp Deg C @pH	21.0	H	0	0	°C	1	10-Oct-2018 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

Batch ID: 2684 **Method:** VOLATILES BY SW8260C

SampID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS18100316-02	1	5.021 (g)	5 (mL)	1	Bulk (5030B)

Batch ID: 133187 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-02	1	0.5272	50 (mL)	94.84

Batch ID: 133213 **Method:** TEXAS TPH BY TX1005 **Prep:** TX 1005_S PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-01	1	10.19	10 (mL)	0.9814
HS18100316-02	1	10.37	10 (mL)	0.9643

Batch ID: 133269 **Method:** TCLP VOLATILES **Prep:** 1311ZHE

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-01	1	25	500 (mL)	1

Batch ID: 133275 **Method:** MERCURY BY SW7471B **Prep:** HG_S_LOWPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-02	1	0.5658	40 (mL)	70.7

Batch ID: 133277 **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D **Prep:** 3541_B_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-02	1	30.18	1 (mL)	0.03313

Batch ID: 133315 **Method:** TCLP SEMIVOLATILES **Prep:** 3510_B

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-01	1	980	1 (mL)	0.00102

Batch ID: 133321 **Method:** TCLP METALS BY SW6020A **Prep:** 3010A_TCLP

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-01	1	1	10 (mL)	10

Batch ID: 133347 **Method:** TCLP MERCURY BY SW7470A **Prep:** 1311_HGPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100316-01	1	10 (mL)	10 (mL)	1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 133187		Test Name : METALS BY SW6020A		Matrix: Soil		
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00		05 Oct 2018 17:54	11 Oct 2018 12:28	1
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00		05 Oct 2018 17:54	10 Oct 2018 00:24	1
Batch ID 133213		Test Name : TEXAS TPH BY TX1005		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30		05 Oct 2018 13:30	09 Oct 2018 01:30	5
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00		05 Oct 2018 13:30	09 Oct 2018 02:00	1
Batch ID 133269		Test Name : TCLP VOLATILES		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30	09 Oct 2018 06:00	09 Oct 2018 11:59	11 Oct 2018 05:34	20
Batch ID 133275		Test Name : MERCURY BY SW7471B		Matrix: Soil		
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00		08 Oct 2018 13:53	09 Oct 2018 16:34	1
Batch ID 133277		Test Name : LOW-LEVEL SEMIVOLATILES BY 8270D		Matrix: Soil		
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00		08 Oct 2018 13:00	09 Oct 2018 13:04	1
Batch ID 133315		Test Name : TCLP SEMIVOLATILES		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30	09 Oct 2018 06:00	09 Oct 2018 13:43	10 Oct 2018 11:32	1
Batch ID 133321		Test Name : TCLP METALS BY SW6020A		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30	09 Oct 2018 06:00	09 Oct 2018 13:00	10 Oct 2018 16:47	1
Batch ID 133347		Test Name : TCLP MERCURY BY SW7470A		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30	09 Oct 2018 06:00	10 Oct 2018 08:30	10 Oct 2018 15:08	1
Batch ID R325036		Test Name : REACTIVE SULFIDE		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30			09 Oct 2018 13:45	1
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00			09 Oct 2018 13:45	1
Batch ID R325039		Test Name : REACTIVE CYANIDE		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30			09 Oct 2018 14:15	1
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00			09 Oct 2018 14:15	1
Batch ID R325118		Test Name : PH SOIL BY SW9045D		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30			10 Oct 2018 13:15	1
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00			10 Oct 2018 13:15	1
Batch ID R325139		Test Name : BURN RATE BY METHOD SW1030		Matrix: Soil		
HS18100316-01	SO-1620-TPSoils-20181005	05 Oct 2018 10:30			10 Oct 2018 15:00	1
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00			10 Oct 2018 15:00	1
Batch ID R325399		Test Name : VOLATILES BY SW8260C		Matrix: Soil		
HS18100316-02	SO-1620-TPSoil(2-3)-20181005	05 Oct 2018 08:00			15 Oct 2018 11:58	1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133213		Instrument: FID-13		Method: TX1005						
MBLK	Sample ID: MBLK-133213	Units: mg/Kg			Analysis Date: 08-Oct-2018 14:32					
Client ID:	Run ID: FID-13_325084	SeqNo: 4765077		PrepDate: 05-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	< 7.4	50								
>nC12 to nC28	< 9.8	50								
>nC28 to nC35	< 9.8	50								
Total Petroleum Hydrocarbon	< 7.4	50								
Surr: 2-Fluorobiphenyl	24.86	0	25	0	99.5	70 - 130				
Surr: Trifluoromethyl benzene	26.01	0	25	0	104	70 - 130				
LCS	Sample ID: LCS-133213	Units: mg/Kg			Analysis Date: 08-Oct-2018 15:02					
Client ID:	Run ID: FID-13_325084	SeqNo: 4765078		PrepDate: 05-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	244.8	50	250	0	97.9	75 - 125				
>nC12 to nC28	294.3	50	250	0	118	75 - 125				
Surr: 2-Fluorobiphenyl	24.4	0	25	0	97.6	70 - 130				
Surr: Trifluoromethyl benzene	24.05	0	25	0	96.2	70 - 130				
LCSD	Sample ID: LCSD-133213	Units: mg/Kg			Analysis Date: 08-Oct-2018 15:32					
Client ID:	Run ID: FID-13_325084	SeqNo: 4765079		PrepDate: 05-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	242.7	50	250	0	97.1	75 - 125	244.8	0.884	20	
>nC12 to nC28	294.8	50	250	0	118	75 - 125	294.3	0.147	20	
Surr: 2-Fluorobiphenyl	25.48	0	25	0	102	70 - 130	24.4	4.32	20	
Surr: Trifluoromethyl benzene	24.27	0	25	0	97.1	70 - 130	24.05	0.908	20	
MS	Sample ID: HS18100277-01MS	Units: mg/Kg			Analysis Date: 08-Oct-2018 16:33					
Client ID:	Run ID: FID-13_325084	SeqNo: 4765081		PrepDate: 05-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
nC6 to nC12	287.4	50	249.5	88.92	79.6	75 - 125				
>nC12 to nC28	6614	50	249.5	6774	-63.9	75 - 125				SEO
Surr: 2-Fluorobiphenyl	48	0	24.95	0	192	70 - 130				S
Surr: Trifluoromethyl benzene	21.43	0	24.95	0	85.9	70 - 130				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133213 **Instrument:** FID-13 **Method:** TX1005

MSD		Sample ID: HS18100277-01MSD			Units: mg/Kg		Analysis Date: 08-Oct-2018 17:02				
Client ID:		Run ID: FID-13_325084			SeqNo: 4765082		PrepDate: 05-Oct-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
nC6 to nC12	269.3	50	248.8	88.92	72.5	75 - 125	287.4	6.51	20	S	
>nC12 to nC28	6253	50	248.8	6774	-209	75 - 125	6614	5.62	20	SEO	
<i>Surr: 2-Fluorobiphenyl</i>	45.62	0	24.88	0	183	70 - 130	48	5.09	20	S	
<i>Surr: Trifluoromethyl benzene</i>	20.49	0	24.88	0	82.4	70 - 130	21.43	4.49	20		

The following samples were analyzed in this batch: HS18100316-01 HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133187	Instrument: ICPMS04	Method: SW6020								
MBLK	Sample ID: MBLK-133187	Units: mg/Kg	Analysis Date: 10-Oct-2018 20:35							
Client ID:	Run ID: ICPMS04_325162	SeqNo: 4767189	PrepDate: 04-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Arsenic < 0.0700 0.500

MBLK	Sample ID: MBLK-133187	Units: mg/Kg	Analysis Date: 09-Oct-2018 23:20							
Client ID:	Run ID: ICPMS04_325034	SeqNo: 4765376	PrepDate: 04-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Barium < 0.0300 0.500

Cadmium < 0.0270 0.500

Chromium 0.0533 0.500

Lead < 0.0130 0.500

Selenium < 0.0910 0.500

Silver < 0.0150 0.500

LCS	Sample ID: LCS-133187	Units: mg/Kg	Analysis Date: 09-Oct-2018 23:22							
Client ID:	Run ID: ICPMS04_325034	SeqNo: 4765377	PrepDate: 04-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Arsenic 10.08 0.500 10 0 101 80 - 120

Barium 9.914 0.500 10 0 99.1 80 - 120

Cadmium 9.948 0.500 10 0 99.5 80 - 120

Chromium 9.863 0.500 10 0 98.6 80 - 120

Lead 9.969 0.500 10 0 99.7 80 - 120

Selenium 10.45 0.500 10 0 104 80 - 120

Silver 9.339 0.500 10 0 93.4 80 - 120

MS	Sample ID: HS18100284-01MS	Units: mg/Kg	Analysis Date: 11-Oct-2018 12:22							
Client ID:	Run ID: ICPMS04_325213	SeqNo: 4767947	PrepDate: 05-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Arsenic 36.65 0.480 9.608 28.71 82.6 75 - 125

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133187		Instrument: ICPMS04			Method: SW6020					
MS		Sample ID: HS18100284-01MS			Units: mg/Kg		Analysis Date: 10-Oct-2018 00:15			
Client ID:		Run ID: ICPMS04_325034			SeqNo: 4765401		PrepDate: 05-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	124.4	0.480	9.608	91.3	344	75 - 125				SO
Cadmium	13.94	0.480	9.608	5.293	90.0	75 - 125				
Chromium	16.5	0.480	9.608	5.582	114	75 - 125				
Lead	195	0.480	9.608	208.8	-144	75 - 125				SEO
Selenium	10.01	0.480	9.608	0.7024	96.9	75 - 125				
Silver	10.19	0.480	9.608	1.497	90.5	75 - 125				
MSD		Sample ID: HS18100284-01MSD			Units: mg/Kg		Analysis Date: 11-Oct-2018 12:24			
Client ID:		Run ID: ICPMS04_325213			SeqNo: 4767948		PrepDate: 05-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	35.04	0.488	9.768	28.71	64.8	75 - 125	36.65	4.49	20	S
MSD		Sample ID: HS18100284-01MSD			Units: mg/Kg		Analysis Date: 10-Oct-2018 00:18			
Client ID:		Run ID: ICPMS04_325034			SeqNo: 4765402		PrepDate: 05-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	108.6	0.488	9.768	91.3	177	75 - 125	124.4	13.6	20	SO
Cadmium	14.6	0.488	9.768	5.293	95.3	75 - 125	13.94	4.65	20	
Chromium	16.87	0.488	9.768	5.582	116	75 - 125	16.5	2.25	20	
Lead	214.7	0.488	9.768	208.8	60.3	75 - 125	195	9.62	20	SEO
Selenium	10.6	0.488	9.768	0.7024	101	75 - 125	10.01	5.66	20	
Silver	10.64	0.488	9.768	1.497	93.6	75 - 125	10.19	4.33	20	
PDS		Sample ID: HS18100284-01PDS			Units: mg/Kg		Analysis Date: 11-Oct-2018 12:26			
Client ID:		Run ID: ICPMS04_325213			SeqNo: 4767949		PrepDate: 05-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	37.43	0.486	9.714	28.71	89.8	75 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133187 **Instrument:** ICPMS04 **Method:** SW6020

PDS		Sample ID: HS18100284-01PDS			Units: mg/Kg		Analysis Date: 10-Oct-2018 00:20			
Client ID:		Run ID: ICPMS04_325034			SeqNo: 4765403		PrepDate: 05-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	98.54	0.486	9.714	91.3	74.6	75 - 125				SO
Cadmium	14.81	0.486	9.714	5.293	98.0	75 - 125				
Chromium	15.05	0.486	9.714	5.582	97.5	75 - 125				
Selenium	10.22	0.486	9.714	0.7024	98.0	75 - 125				
Silver	10.1	0.486	9.714	1.497	88.6	75 - 125				

PDS		Sample ID: HS18100284-01PDS			Units: mg/Kg		Analysis Date: 10-Oct-2018 16:41			
Client ID:		Run ID: ICPMS04_325108			SeqNo: 4766718		PrepDate: 05-Oct-2018		DF: 20	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	414.2	9.71	194.3	217.1	101	75 - 125				

SD		Sample ID: HS18100284-01SD			Units: mg/Kg		Analysis Date: 11-Oct-2018 12:20			
Client ID:		Run ID: ICPMS04_325213			SeqNo: 4767946		PrepDate: 05-Oct-2018		DF: 5	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	29.16	2.43					28.71	1.58	10	

SD		Sample ID: HS18100284-01SD			Units: mg/Kg		Analysis Date: 10-Oct-2018 00:13			
Client ID:		Run ID: ICPMS04_325034			SeqNo: 4765400		PrepDate: 05-Oct-2018		DF: 5	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	96.45	2.43					91.3	5.65	10	
Cadmium	5.498	2.43					5.293	3.87	10	
Chromium	5.8	2.43					5.582	3.91	10	
Selenium	1.599	2.43					0.7024	0	10	J
Silver	1.438	2.43					1.497	0	10	J

SD		Sample ID: HS18100284-01SD			Units: mg/Kg		Analysis Date: 10-Oct-2018 16:39			
Client ID:		Run ID: ICPMS04_325108			SeqNo: 4766717		PrepDate: 05-Oct-2018		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	216.8	48.6					217.1	0.163	10	

The following samples were analyzed in this batch: HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133275	Instrument: HG03	Method: SW7471A
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MBLK	Sample ID: MBLK-133275	Units: ug/Kg	Analysis Date: 09-Oct-2018 15:48							
Client ID:	Run ID: HG03_325062	SeqNo: 4764614	PrepDate: 08-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury < 0.470 3.32

LCS	Sample ID: LCS-133275	Units: ug/Kg	Analysis Date: 09-Oct-2018 15:50							
Client ID:	Run ID: HG03_325062	SeqNo: 4764615	PrepDate: 08-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 310 3.32 333.3 0 93.0 80 - 120

MS	Sample ID: HS18091517-21MS	Units: ug/Kg	Analysis Date: 09-Oct-2018 15:53							
Client ID:	Run ID: HG03_325062	SeqNo: 4764617	PrepDate: 08-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 317.3 3.42 342.6 7.7 90.4 80 - 120

MSD	Sample ID: HS18091517-21MSD	Units: ug/Kg	Analysis Date: 09-Oct-2018 15:55							
Client ID:	Run ID: HG03_325062	SeqNo: 4764618	PrepDate: 08-Oct-2018 DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual

Mercury 335.2 3.56 356.6 7.7 91.8 80 - 120 317.3 5.5 20

The following samples were analyzed in this batch: HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133321		Instrument: ICPMS05		Method: SW1311/6020					
MBLK	Sample ID: MBLKT2-133321	Units: mg/L		Analysis Date: 10-Oct-2018 16:23					
Client ID:	Run ID: ICPMS05_325099	SeqNo: 4766860		PrepDate: 09-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	

Arsenic	< 0.00400	0.0500						
Barium	< 0.0190	0.200						
Cadmium	< 0.00200	0.0500						
Chromium	< 0.00400	0.0500						
Lead	< 0.00600	0.0500						
Selenium	< 0.0110	0.0500						
Silver	< 0.00200	0.0500						

MBLK	Sample ID: MBLKT1-133321	Units: mg/L		Analysis Date: 10-Oct-2018 16:21					
Client ID:	Run ID: ICPMS05_325099	SeqNo: 4766859		PrepDate: 09-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	

Arsenic	< 0.00400	0.0500						
Barium	< 0.0190	0.200						
Cadmium	< 0.00200	0.0500						
Chromium	< 0.00400	0.0500						
Lead	< 0.00600	0.0500						
Selenium	< 0.0110	0.0500						
Silver	< 0.00200	0.0500						

MBLK	Sample ID: MBLK-133321	Units: mg/L		Analysis Date: 10-Oct-2018 16:25					
Client ID:	Run ID: ICPMS05_325099	SeqNo: 4766861		PrepDate: 09-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	

Arsenic	< 0.000400	0.00500						
Barium	< 0.00190	0.0200						
Cadmium	< 0.000200	0.00500						
Chromium	< 0.000400	0.00500						
Lead	< 0.000600	0.00500						
Selenium	< 0.00110	0.00500						
Silver	< 0.000200	0.00500						

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133321	Instrument: ICPMS05	Method: SW1311/6020
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LCS		Sample ID: LCS-133321			Units: mg/L		Analysis Date: 10-Oct-2018 16:27			
Client ID:		Run ID: ICPMS05_325099			SeqNo: 4766862		PrepDate: 09-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04785	0.00500	0.05	0	95.7	80 - 120				
Barium	0.04428	0.0200	0.05	0	88.6	80 - 120				
Cadmium	0.04485	0.00500	0.05	0	89.7	80 - 120				
Chromium	0.04734	0.00500	0.05	0	94.7	80 - 120				
Lead	0.04635	0.00500	0.05	0	92.7	80 - 120				
Selenium	0.05089	0.00500	0.05	0	102	80 - 120				
Silver	0.04636	0.00500	0.05	0	92.7	80 - 120				

MS		Sample ID: HS18100286-01MS			Units: mg/L		Analysis Date: 10-Oct-2018 16:53			
Client ID:		Run ID: ICPMS05_325099			SeqNo: 4766875		PrepDate: 09-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.5178	0.0500	0.5	0.0033	103	80 - 120				
Barium	0.8181	0.200	0.5	0.2878	106	80 - 120				
Cadmium	0.518	0.0500	0.5	0.00007	104	80 - 120				
Chromium	0.6483	0.0500	0.5	0.1415	101	80 - 120				
Lead	0.5516	0.0500	0.5	0.00006	110	80 - 120				
Selenium	0.5345	0.0500	0.5	-0.0002	107	80 - 120				
Silver	0.5031	0.0500	0.5	0.00032	101	80 - 120				

MSD		Sample ID: HS18100286-01MSD			Units: mg/L		Analysis Date: 10-Oct-2018 16:55			
Client ID:		Run ID: ICPMS05_325099			SeqNo: 4766876		PrepDate: 09-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.5014	0.0500	0.5	0.0033	99.6	80 - 120	0.5178	3.22	20	
Barium	0.7665	0.200	0.5	0.2878	95.7	80 - 120	0.8181	6.5	20	
Cadmium	0.485	0.0500	0.5	0.00007	97.0	80 - 120	0.518	6.58	20	
Chromium	0.6328	0.0500	0.5	0.1415	98.3	80 - 120	0.6483	2.42	20	
Lead	0.534	0.0500	0.5	0.00006	107	80 - 120	0.5516	3.24	20	
Selenium	0.5106	0.0500	0.5	-0.0002	102	80 - 120	0.5345	4.58	20	
Silver	0.4628	0.0500	0.5	0.00032	92.5	80 - 120	0.5031	8.35	20	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133321 **Instrument:** ICPMS05 **Method:** SW1311/6020

PDS		Sample ID: HS18100286-01PDS			Units: mg/L		Analysis Date: 10-Oct-2018 16:57			
Client ID:		Run ID: ICPMS05_325099			SeqNo: 4766877		PrepDate: 09-Oct-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	1.16	0.0500	1	0.0033	116	75 - 125				
Barium	1.434	0.200	1	0.2878	115	75 - 125				
Cadmium	1.159	0.0500	1	0.00007	116	75 - 125				
Chromium	1.253	0.0500	1	0.1415	111	75 - 125				
Lead	1.203	0.0500	1	0.00006	120	75 - 125				
Selenium	1.179	0.0500	1	-0.0002	118	75 - 125				
Silver	1.105	0.0500	1	0.00032	110	75 - 125				

SD		Sample ID: HS18100286-01SD			Units: mg/L		Analysis Date: 10-Oct-2018 16:51			
Client ID:		Run ID: ICPMS05_325099			SeqNo: 4766874		PrepDate: 09-Oct-2018		DF: 5	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	< 0.0200	0.250					0.0033	0	10	
Barium	0.2593	1.00					0.2878	0	10	J
Cadmium	< 0.0100	0.250					0.00007	0	10	
Chromium	0.1275	0.250					0.1415	0	10	J
Lead	< 0.0300	0.250					0.00006	0	10	
Selenium	< 0.0550	0.250					-0.0002	0	10	
Silver	< 0.0100	0.250					0.00032	0	10	

The following samples were analyzed in this batch: HS18100316-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133347		Instrument: HG03		Method: SW7470					
MBLK	Sample ID: MBLKT2-133347	Units: mg/L		Analysis Date: 10-Oct-2018 13:56					
Client ID:	Run ID: HG03_325131	SeqNo: 4766386		PrepDate: 10-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Mercury	< 0.0000300	0.000200							
MBLK	Sample ID: MBLKT3-133347	Units: mg/L		Analysis Date: 10-Oct-2018 13:58					
Client ID:	Run ID: HG03_325131	SeqNo: 4766387		PrepDate: 10-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Mercury	< 0.0000300	0.000200							
MBLK	Sample ID: MBLKT1-133347	Units: mg/L		Analysis Date: 10-Oct-2018 13:55					
Client ID:	Run ID: HG03_325131	SeqNo: 4766385		PrepDate: 10-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Mercury	< 0.0000300	0.000200							
MBLK	Sample ID: MBLK-133347	Units: mg/L		Analysis Date: 10-Oct-2018 14:00					
Client ID:	Run ID: HG03_325131	SeqNo: 4766388		PrepDate: 10-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Mercury	< 0.0000300	0.000200							
LCS	Sample ID: LCS-133347	Units: mg/L		Analysis Date: 10-Oct-2018 14:02					
Client ID:	Run ID: HG03_325131	SeqNo: 4766389		PrepDate: 10-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Mercury	0.00488	0.000200	0.005	0	97.6	80 - 120			
MS	Sample ID: HS18100192-01MS	Units: mg/L		Analysis Date: 10-Oct-2018 14:24					
Client ID:	Run ID: HG03_325131	SeqNo: 4766399		PrepDate: 10-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Mercury	0.00982	0.000200	0.005	0.00488	98.8	75 - 125			

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133347 **Instrument:** HG03 **Method:** SW7470

MSD	Sample ID: HS18100192-01MSD	Units: mg/L			Analysis Date: 10-Oct-2018 14:26				
Client ID:	Run ID: HG03_325131	SeqNo: 4766400	PrepDate: 10-Oct-2018	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Mercury	0.00971	0.000200	0.005	0.00488	96.6	75 - 125	0.00982	1.13	20

The following samples were analyzed in this batch:

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
MBLK	Sample ID: MBLK-133277	Units: ug/Kg			Analysis Date: 09-Oct-2018 12:04					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765356	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	< 1.2	6.6								
2,4,5-Trichlorophenol	< 2.5	6.6								
2,4,6-Trichlorophenol	< 1.7	6.6								
2,4-Dichlorophenol	< 1.3	6.6								
2,4-Dimethylphenol	< 3.3	6.6								
2,4-Dinitrophenol	< 4.5	13								
2,4-Dinitrotoluene	< 0.90	6.6								
2,6-Dinitrotoluene	< 3.3	6.6								
2-Chloronaphthalene	< 1.3	6.6								
2-Chlorophenol	< 1.3	6.6								
2-Methylnaphthalene	< 0.50	3.3								
2-Methylphenol	< 1.1	6.6								
2-Nitroaniline	< 1.9	6.6								
2-Nitrophenol	< 2.5	6.6								
3&4-Methylphenol	< 1.0	6.6								
3,3'-Dichlorobenzidine	< 2.5	6.6								
3-Nitroaniline	< 1.9	6.6								
4,6-Dinitro-2-methylphenol	< 2.1	6.6								
4-Bromophenyl phenyl ether	< 1.6	6.6								
4-Chloro-3-methylphenol	< 0.70	6.6								
4-Chloroaniline	< 1.1	6.6								
4-Chlorophenyl phenyl ether	< 1.5	6.6								
4-Nitroaniline	< 2.2	6.6								
4-Nitrophenol	< 1.9	13								
Acenaphthene	< 0.50	3.3								
Acenaphthylene	< 1.0	3.3								
Anthracene	< 0.50	3.3								
Benz(a)anthracene	< 1.6	3.3								
Benzidine	< 1.4	6.6								
Benzo(a)pyrene	< 1.0	3.3								
Benzo(b)fluoranthene	< 1.2	3.3								
Benzo(g,h,i)perylene	< 0.70	3.3								
Benzo(k)fluoranthene	< 0.90	3.3								
Benzyl alcohol	< 0.70	6.6								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
MBLK	Sample ID: MBLK-133277	Units: ug/Kg			Analysis Date: 09-Oct-2018 12:04					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765356	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	< 1.4	6.6								
Bis(2-chloroethoxy)methane	< 0.90	6.6								
Bis(2-chloroethyl)ether	< 1.1	6.6								
Bis(2-ethylhexyl)phthalate	< 1.7	6.6								
Butyl benzyl phthalate	< 1.3	6.6								
Carbazole	< 1.2	6.6								
Chrysene	< 0.80	3.3								
Dibenz(a,h)anthracene	< 1.6	3.3								
Dibenzofuran	< 0.70	3.3								
Diethyl phthalate	< 1.0	6.6								
Dimethyl phthalate	< 0.80	6.6								
Di-n-butyl phthalate	< 1.2	6.6								
Di-n-octyl phthalate	< 0.90	6.6								
Fluoranthene	< 1.1	3.3								
Fluorene	< 1.1	3.3								
Hexachlorobenzene	< 0.90	6.6								
Hexachlorobutadiene	< 1.2	6.6								
Hexachlorocyclopentadiene	< 0.80	6.6								
Hexachloroethane	< 1.5	6.6								
Indeno(1,2,3-cd)pyrene	< 0.80	3.3								
Isophorone	< 0.80	6.6								
Naphthalene	< 0.60	3.3								
Nitrobenzene	< 0.90	6.6								
N-Nitrosodimethylamine	< 1.2	6.6								
N-Nitrosodi-n-propylamine	< 1.1	6.6								
N-Nitrosodiphenylamine	< 0.70	6.6								
Pentachlorophenol	< 3.3	6.6								
Phenanthrene	< 1.5	3.3								
Phenol	< 1.1	6.6								
Pyrene	< 0.60	3.3								
Surr: 2,4,6-Tribromophenol	146.7	0	167	0	87.8	36 - 126				
Surr: 2-Fluorobiphenyl	156.3	0	167	0	93.6	43 - 125				
Surr: 2-Fluorophenol	112.8	0	167	0	67.5	37 - 125				
Surr: 4-Terphenyl-d14	194.9	0	167	0	117	32 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277 **Instrument:** SV-7 **Method:** SW8270

MBLK Sample ID: **MBLK-133277** Units: **ug/Kg** Analysis Date: **09-Oct-2018 12:04**
Client ID: Run ID: **SV-7_325093** SeqNo: **4765356** PrepDate: **08-Oct-2018** DF: **1**
Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

<i>Surr: Nitrobenzene-d5</i>	139.6	0	167	0	83.6	37 - 125				
<i>Surr: Phenol-d6</i>	134.4	0	167	0	80.5	40 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
LCS	Sample ID: LCS-133277	Units: ug/Kg			Analysis Date: 09-Oct-2018 12:24					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765357		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	134.1	6.6	167	0	80.3	50 - 120				
2,4,5-Trichlorophenol	147.1	6.6	167	0	88.1	45 - 127				
2,4,6-Trichlorophenol	137	6.6	167	0	82.0	45 - 130				
2,4-Dichlorophenol	142.4	6.6	167	0	85.2	45 - 125				
2,4-Dimethylphenol	121.5	6.6	167	0	72.8	45 - 120				
2,4-Dinitrophenol	107.6	13	167	0	64.4	10 - 126				
2,4-Dinitrotoluene	148.9	6.6	167	0	89.2	50 - 130				
2,6-Dinitrotoluene	153.9	6.6	167	0	92.2	50 - 125				
2-Chloronaphthalene	145.3	6.6	167	0	87.0	50 - 145				
2-Chlorophenol	122.5	6.6	167	0	73.3	45 - 120				
2-Methylnaphthalene	146.7	3.3	167	0	87.8	50 - 120				
2-Methylphenol	132.7	6.6	167	0	79.5	45 - 120				
2-Nitroaniline	157.7	6.6	167	0	94.5	45 - 138				
2-Nitrophenol	138.3	6.6	167	0	82.8	45 - 125				
3&4-Methylphenol	119.7	6.6	167	0	71.7	45 - 120				
3,3'-Dichlorobenzidine	154.8	6.6	167	0	92.7	15 - 120				
3-Nitroaniline	145.1	6.6	167	0	86.9	40 - 120				
4,6-Dinitro-2-methylphenol	147.9	6.6	167	0	88.6	15 - 135				
4-Bromophenyl phenyl ether	149.2	6.6	167	0	89.3	50 - 125				
4-Chloro-3-methylphenol	135.4	6.6	167	0	81.1	45 - 130				
4-Chloroaniline	121.8	6.6	167	0	73.0	20 - 120				
4-Chlorophenyl phenyl ether	155	6.6	167	0	92.8	50 - 120				
4-Nitroaniline	141.7	6.6	167	0	84.8	50 - 127				
4-Nitrophenol	162.2	13	167	0	97.1	40 - 147				
Acenaphthene	133.6	3.3	167	0	80.0	50 - 120				
Acenaphthylene	145.7	3.3	167	0	87.2	50 - 120				
Anthracene	140.8	3.3	167	0	84.3	50 - 123				
Benz(a)anthracene	152.9	3.3	167	0	91.5	50 - 131				
Benzdine	82.44	6.6	167	0	49.4	10 - 120				
Benzo(a)pyrene	161.6	3.3	167	0	96.8	50 - 130				
Benzo(b)fluoranthene	167.1	3.3	167	0	100	50 - 137				
Benzo(g,h,i)perylene	151.8	3.3	167	0	90.9	50 - 130				
Benzo(k)fluoranthene	148.9	3.3	167	0	89.2	50 - 143				
Benzyl alcohol	128.1	6.6	167	0	76.7	40 - 143				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
LCS	Sample ID: LCS-133277	Units: ug/Kg			Analysis Date: 09-Oct-2018 12:24					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765357		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	112.5	6.6	167	0	67.4	50 - 120				
Bis(2-chloroethoxy)methane	123.8	6.6	167	0	74.2	50 - 120				
Bis(2-chloroethyl)ether	122.8	6.6	167	0	73.5	45 - 127				
Bis(2-ethylhexyl)phthalate	143.7	6.6	167	0	86.0	21 - 148				
Butyl benzyl phthalate	153.3	6.6	167	0	91.8	50 - 136				
Carbazole	143.5	6.6	167	0	85.9	50 - 143				
Chrysene	150.1	3.3	167	0	89.9	50 - 130				
Dibenz(a,h)anthracene	158.7	3.3	167	0	95.0	50 - 130				
Dibenzofuran	146.5	3.3	167	0	87.7	50 - 125				
Diethyl phthalate	144.7	6.6	167	0	86.7	50 - 125				
Dimethyl phthalate	135.1	6.6	167	0	80.9	50 - 125				
Di-n-butyl phthalate	152	6.6	167	0	91.0	50 - 140				
Di-n-octyl phthalate	157.8	6.6	167	0	94.5	50 - 140				
Fluoranthene	148.1	3.3	167	0	88.7	50 - 131				
Fluorene	149.5	3.3	167	0	89.5	50 - 125				
Hexachlorobenzene	145.3	6.6	167	0	87.0	50 - 124				
Hexachlorobutadiene	141	6.6	167	0	84.4	50 - 125				
Hexachlorocyclopentadiene	101.6	6.6	167	0	60.8	45 - 135				
Hexachloroethane	140.1	6.6	167	0	83.9	45 - 125				
Indeno(1,2,3-cd)pyrene	186.1	3.3	167	0	111	45 - 139				
Isophorone	120.2	6.6	167	0	72.0	45 - 130				
Naphthalene	136.5	3.3	167	0	81.8	50 - 125				
Nitrobenzene	113.7	6.6	167	0	68.1	50 - 125				
N-Nitrosodimethylamine	98.2	6.6	167	0	58.8	20 - 140				
N-Nitrosodi-n-propylamine	117.3	6.6	167	0	70.2	45 - 120				
N-Nitrosodiphenylamine	144.2	6.6	167	0	86.3	50 - 130				
Pentachlorophenol	123.5	6.6	167	0	73.9	23 - 136				
Phenanthrene	139.7	3.3	167	0	83.7	50 - 125				
Phenol	131.8	6.6	167	0	78.9	45 - 130				
Pyrene	163.4	3.3	167	0	97.8	45 - 130				
Surr: 2,4,6-Tribromophenol	154.6	0	167	0	92.6	36 - 126				
Surr: 2-Fluorobiphenyl	153.6	0	167	0	92.0	43 - 125				
Surr: 2-Fluorophenol	115.4	0	167	0	69.1	37 - 125				
Surr: 4-Terphenyl-d14	185.7	0	167	0	111	32 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277 **Instrument:** SV-7 **Method:** SW8270

LCS		Sample ID: LCS-133277		Units: ug/Kg		Analysis Date: 09-Oct-2018 12:24				
Client ID:		Run ID: SV-7_325093		SeqNo: 4765357		PrepDate: 08-Oct-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Nitrobenzene-d5	131.8	0	167	0	78.9	37 - 125				
Surr: Phenol-d6	123.2	0	167	0	73.8	40 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
MS	Sample ID: HS18100214-08MS	Units: ug/Kg			Analysis Date: 09-Oct-2018 13:25					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765360	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	140.3	6.6	166.1	0	84.5	50 - 120				
2,4,5-Trichlorophenol	142.4	6.6	166.1	0	85.7	45 - 127				
2,4,6-Trichlorophenol	137.3	6.6	166.1	0	82.6	45 - 130				
2,4-Dichlorophenol	145.6	6.6	166.1	0	87.7	45 - 125				
2,4-Dimethylphenol	129.7	6.6	166.1	0	78.1	45 - 120				
2,4-Dinitrophenol	111.6	13	166.1	0	67.2	10 - 126				
2,4-Dinitrotoluene	145.5	6.6	166.1	0	87.6	50 - 130				
2,6-Dinitrotoluene	150.1	6.6	166.1	0	90.4	50 - 125				
2-Chloronaphthalene	143.4	6.6	166.1	0	86.3	50 - 145				
2-Chlorophenol	142.1	6.6	166.1	0	85.5	45 - 120				
2-Methylnaphthalene	143.5	3.3	166.1	1.515	85.5	50 - 120				
2-Methylphenol	145.2	6.6	166.1	0	87.4	45 - 120				
2-Nitroaniline	167.3	6.6	166.1	0	101	45 - 138				
2-Nitrophenol	132.9	6.6	166.1	0	80.0	45 - 125				
3&4-Methylphenol	137.9	6.6	166.1	0	83.0	45 - 120				
3,3'-Dichlorobenzidine	157.4	6.6	166.1	0	94.8	15 - 120				
3-Nitroaniline	144.6	6.6	166.1	0	87.1	40 - 120				
4,6-Dinitro-2-methylphenol	162.2	6.6	166.1	0	97.7	15 - 135				
4-Bromophenyl phenyl ether	157.3	6.6	166.1	0	94.7	50 - 125				
4-Chloro-3-methylphenol	133.2	6.6	166.1	0	80.2	45 - 130				
4-Chloroaniline	130.1	6.6	166.1	0	78.3	20 - 120				
4-Chlorophenyl phenyl ether	147.4	6.6	166.1	0	88.8	50 - 120				
4-Nitroaniline	137.4	6.6	166.1	0	82.7	50 - 127				
4-Nitrophenol	137.9	13	166.1	0	83.0	40 - 147				
Acenaphthene	131.9	3.3	166.1	1.837	78.3	50 - 120				
Acenaphthylene	145.7	3.3	166.1	0	87.7	50 - 120				
Anthracene	145.8	3.3	166.1	0.5694	87.4	50 - 123				
Benz(a)anthracene	159.2	3.3	166.1	1.222	95.1	50 - 131				
Benzdine	65.78	6.6	166.1	0	39.6	10 - 120				
Benzo(a)pyrene	167.1	3.3	166.1	0	101	50 - 130				
Benzo(b)fluoranthene	171.2	3.3	166.1	2.363	102	50 - 137				
Benzo(g,h,i)perylene	152	3.3	166.1	0	91.5	50 - 130				
Benzo(k)fluoranthene	158.5	3.3	166.1	0.8291	94.9	50 - 143				
Benzyl alcohol	134	6.6	166.1	0	80.7	40 - 143				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
MS	Sample ID: HS18100214-08MS	Units: ug/Kg			Analysis Date: 09-Oct-2018 13:25					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765360	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	128	6.6	166.1	0	77.0	50 - 120				
Bis(2-chloroethoxy)methane	117.8	6.6	166.1	0	70.9	50 - 120				
Bis(2-chloroethyl)ether	126.6	6.6	166.1	0	76.2	45 - 127				
Bis(2-ethylhexyl)phthalate	145.4	6.6	166.1	5.12	84.5	21 - 148				
Butyl benzyl phthalate	151.7	6.6	166.1	0	91.3	50 - 136				
Carbazole	151.1	6.6	166.1	0	91.0	50 - 143				
Chrysene	152.6	3.3	166.1	1.792	90.8	50 - 130				
Dibenz(a,h)anthracene	165.2	3.3	166.1	0	99.5	50 - 130				
Dibenzofuran	148.8	3.3	166.1	1.882	88.4	50 - 125				
Diethyl phthalate	145	6.6	166.1	0	87.3	50 - 125				
Dimethyl phthalate	134.7	6.6	166.1	0	81.1	50 - 125				
Di-n-butyl phthalate	144.3	6.6	166.1	0	86.9	50 - 140				
Di-n-octyl phthalate	160.1	6.6	166.1	0.6786	96.0	50 - 140				
Fluoranthene	159.2	3.3	166.1	5.068	92.8	50 - 131				
Fluorene	151.5	3.3	166.1	1.754	90.1	50 - 125				
Hexachlorobenzene	158.5	6.6	166.1	0	95.4	50 - 124				
Hexachlorobutadiene	137.6	6.6	166.1	0	82.8	50 - 125				
Hexachlorocyclopentadiene	107.2	6.6	166.1	0	64.5	45 - 135				
Hexachloroethane	147.7	6.6	166.1	0	88.9	45 - 125				
Indeno(1,2,3-cd)pyrene	193	3.3	166.1	0	116	45 - 139				
Isophorone	119.5	6.6	166.1	0	71.9	45 - 130				
Naphthalene	140.5	3.3	166.1	0	84.6	50 - 125				
Nitrobenzene	126.4	6.6	166.1	0	76.1	50 - 125				
N-Nitrosodimethylamine	105.8	6.6	166.1	0	63.7	20 - 140				
N-Nitrosodi-n-propylamine	133.6	6.6	166.1	0	80.4	45 - 120				
N-Nitrosodiphenylamine	149.9	6.6	166.1	1.656	89.2	50 - 130				
Pentachlorophenol	136.2	6.6	166.1	0	82.0	23 - 136				
Phenanthrene	155.4	3.3	166.1	5.885	90.0	50 - 125				
Phenol	142.9	6.6	166.1	0	86.0	45 - 130				
Pyrene	174.3	3.3	166.1	3.767	103	45 - 130				
Surr: 2,4,6-Tribromophenol	144.6	0	166.1	0	87.1	36 - 126				
Surr: 2-Fluorobiphenyl	152.7	0	166.1	0	91.9	43 - 125				
Surr: 2-Fluorophenol	116	0	166.1	0	69.8	37 - 125				
Surr: 4-Terphenyl-d14	176.6	0	166.1	0	106	32 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277 **Instrument:** SV-7 **Method:** SW8270

MS Sample ID: **HS18100214-08MS** Units: **ug/Kg** Analysis Date: **09-Oct-2018 13:25**
Client ID: Run ID: **SV-7_325093** SeqNo: **4765360** PrepDate: **08-Oct-2018** DF: **1**
Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

<i>Surr: Nitrobenzene-d5</i>	129.5	0	166.1	0	78.0	37 - 125				
<i>Surr: Phenol-d6</i>	131.8	0	166.1	0	79.3	40 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
MSD	Sample ID: HS18100214-08MSD	Units: ug/Kg			Analysis Date: 09-Oct-2018 14:26					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765363	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	134.4	6.6	166.1	0	80.9	50 - 120	140.3	4.34	30	
2,4,5-Trichlorophenol	135.7	6.6	166.1	0	81.7	45 - 127	142.4	4.79	30	
2,4,6-Trichlorophenol	126.3	6.6	166.1	0	76.1	45 - 130	137.3	8.33	30	
2,4-Dichlorophenol	135.4	6.6	166.1	0	81.6	45 - 125	145.6	7.28	30	
2,4-Dimethylphenol	124	6.6	166.1	0	74.6	45 - 120	129.7	4.56	30	
2,4-Dinitrophenol	112.8	13	166.1	0	67.9	10 - 126	111.6	1.11	30	
2,4-Dinitrotoluene	140	6.6	166.1	0	84.3	50 - 130	145.5	3.87	30	
2,6-Dinitrotoluene	144.6	6.6	166.1	0	87.1	50 - 125	150.1	3.74	30	
2-Chloronaphthalene	139.9	6.6	166.1	0	84.2	50 - 145	143.4	2.5	30	
2-Chlorophenol	147.1	6.6	166.1	0	88.6	45 - 120	142.1	3.46	30	
2-Methylnaphthalene	139.6	3.3	166.1	1.515	83.1	50 - 120	143.5	2.77	30	
2-Methylphenol	142.7	6.6	166.1	0	85.9	45 - 120	145.2	1.73	30	
2-Nitroaniline	122.7	6.6	166.1	0	73.9	45 - 138	167.3	30.8	30	R
2-Nitrophenol	130.6	6.6	166.1	0	78.7	45 - 125	132.9	1.71	30	
3&4-Methylphenol	135	6.6	166.1	0	81.3	45 - 120	137.9	2.14	30	
3,3'-Dichlorobenzidine	152.8	6.6	166.1	0	92.0	15 - 120	157.4	3	30	
3-Nitroaniline	143.5	6.6	166.1	0	86.4	40 - 120	144.6	0.792	30	
4,6-Dinitro-2-methylphenol	162.3	6.6	166.1	0	97.7	15 - 135	162.2	0.0332	30	
4-Bromophenyl phenyl ether	155.1	6.6	166.1	0	93.4	50 - 125	157.3	1.41	30	
4-Chloro-3-methylphenol	129.3	6.6	166.1	0	77.8	45 - 130	133.2	3.02	30	
4-Chloroaniline	134.4	6.6	166.1	0	80.9	20 - 120	130.1	3.27	30	
4-Chlorophenyl phenyl ether	146.6	6.6	166.1	0	88.3	50 - 120	147.4	0.537	30	
4-Nitroaniline	144.6	6.6	166.1	0	87.1	50 - 127	137.4	5.13	30	
4-Nitrophenol	143	13	166.1	0	86.1	40 - 147	137.9	3.62	30	
Acenaphthene	124.9	3.3	166.1	1.837	74.1	50 - 120	131.9	5.47	30	
Acenaphthylene	138.5	3.3	166.1	0	83.4	50 - 120	145.7	5.02	30	
Anthracene	148	3.3	166.1	0.5694	88.8	50 - 123	145.8	1.49	30	
Benz(a)anthracene	159.8	3.3	166.1	1.222	95.5	50 - 131	159.2	0.345	30	
Benzidine	61.5	6.6	166.1	0	37.0	10 - 120	65.78	6.72	30	
Benzo(a)pyrene	165.6	3.3	166.1	0	99.7	50 - 130	167.1	0.891	30	
Benzo(b)fluoranthene	177.9	3.3	166.1	2.363	106	50 - 137	171.2	3.87	30	
Benzo(g,h,i)perylene	154.7	3.3	166.1	0	93.1	50 - 130	152	1.72	30	
Benzo(k)fluoranthene	157.3	3.3	166.1	0.8291	94.2	50 - 143	158.5	0.739	30	
Benzyl alcohol	146.5	6.6	166.1	0	88.2	40 - 143	134	8.92	30	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277		Instrument: SV-7		Method: SW8270						
MSD	Sample ID: HS18100214-08MSD	Units: ug/Kg			Analysis Date: 09-Oct-2018 14:26					
Client ID:	Run ID: SV-7_325093	SeqNo: 4765363	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	127.2	6.6	166.1	0	76.6	50 - 120	128	0.585	30	
Bis(2-chloroethoxy)methane	121.8	6.6	166.1	0	73.3	50 - 120	117.8	3.31	30	
Bis(2-chloroethyl)ether	126.6	6.6	166.1	0	76.2	45 - 127	126.6	0.00366	30	
Bis(2-ethylhexyl)phthalate	147.7	6.6	166.1	5.12	85.9	21 - 148	145.4	1.56	30	
Butyl benzyl phthalate	148.4	6.6	166.1	0	89.3	50 - 136	151.7	2.25	30	
Carbazole	153.1	6.6	166.1	0	92.2	50 - 143	151.1	1.28	30	
Chrysene	152.9	3.3	166.1	1.792	91.0	50 - 130	152.6	0.224	30	
Dibenz(a,h)anthracene	159.6	3.3	166.1	0	96.1	50 - 130	165.2	3.5	30	
Dibenzofuran	140.6	3.3	166.1	1.882	83.5	50 - 125	148.8	5.66	30	
Diethyl phthalate	137.3	6.6	166.1	0	82.7	50 - 125	145	5.46	30	
Dimethyl phthalate	124.6	6.6	166.1	0	75.0	50 - 125	134.7	7.8	30	
Di-n-butyl phthalate	145.9	6.6	166.1	0	87.8	50 - 140	144.3	1.05	30	
Di-n-octyl phthalate	154.4	6.6	166.1	0.6786	92.5	50 - 140	160.1	3.68	30	
Fluoranthene	154.4	3.3	166.1	5.068	89.9	50 - 131	159.2	3.05	30	
Fluorene	139.8	3.3	166.1	1.754	83.1	50 - 125	151.5	8.02	30	
Hexachlorobenzene	158.2	6.6	166.1	0	95.3	50 - 124	158.5	0.197	30	
Hexachlorobutadiene	130.3	6.6	166.1	0	78.5	50 - 125	137.6	5.39	30	
Hexachlorocyclopentadiene	102.3	6.6	166.1	0	61.6	45 - 135	107.2	4.65	30	
Hexachloroethane	148.3	6.6	166.1	0	89.3	45 - 125	147.7	0.404	30	
Indeno(1,2,3-cd)pyrene	181.2	3.3	166.1	0	109	45 - 139	193	6.3	30	
Isophorone	111.4	6.6	166.1	0	67.1	45 - 130	119.5	6.98	30	
Naphthalene	131.7	3.3	166.1	0	79.3	50 - 125	140.5	6.5	30	
Nitrobenzene	123	6.6	166.1	0	74.0	50 - 125	126.4	2.78	30	
N-Nitrosodimethylamine	109.3	6.6	166.1	0	65.8	20 - 140	105.8	3.28	30	
N-Nitrosodi-n-propylamine	130.5	6.6	166.1	0	78.6	45 - 120	133.6	2.35	30	
N-Nitrosodiphenylamine	152.7	6.6	166.1	1.656	90.9	50 - 130	149.9	1.86	30	
Pentachlorophenol	141.5	6.6	166.1	0	85.2	23 - 136	136.2	3.81	30	
Phenanthrene	152.5	3.3	166.1	5.885	88.3	50 - 125	155.4	1.85	30	
Phenol	145.7	6.6	166.1	0	87.7	45 - 130	142.9	1.94	30	
Pyrene	161.4	3.3	166.1	3.767	94.9	45 - 130	174.3	7.7	30	
Surr: 2,4,6-Tribromophenol	142.9	0	166.1	0	86.0	36 - 126	144.6	1.21	30	
Surr: 2-Fluorobiphenyl	143	0	166.1	0	86.1	43 - 125	152.7	6.55	30	
Surr: 2-Fluorophenol	126.2	0	166.1	0	76.0	37 - 125	116	8.48	30	
Surr: 4-Terphenyl-d14	175.6	0	166.1	0	106	32 - 125	176.6	0.576	30	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133277 Instrument: SV-7 Method: SW8270

MSD Sample ID: HS18100214-08MSD Units: ug/Kg Analysis Date: 09-Oct-2018 14:26
Client ID: Run ID: SV-7_325093 SeqNo: 4765363 PrepDate: 08-Oct-2018 DF: 1
Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

Surr: Nitrobenzene-d5	136.2	0	166.1	0	82.0	37 - 125	129.5	5.03	30
Surr: Phenol-d6	133.4	0	166.1	0	80.3	40 - 125	131.8	1.21	30

The following samples were analyzed in this batch: HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133315		Instrument: SV-4		Method: SW8270						
MBLK	Sample ID: MBLK-133315	Units: ug/L			Analysis Date: 09-Oct-2018 19:58					
Client ID:	Run ID: SV-4_325100	SeqNo: 4765621		PrepDate: 09-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
2,4,5-Trichlorophenol	< 0.50	5.0								
2,4,6-Trichlorophenol	< 0.40	5.0								
2,4-Dinitrotoluene	< 0.30	5.0								
Hexachlorobenzene	< 0.30	5.0								
Hexachlorobutadiene	< 0.50	5.0								
Hexachloroethane	< 0.80	5.0								
Nitrobenzene	< 0.40	5.0								
Pentachlorophenol	< 0.80	5.0								
Pyridine	< 0.30	5.0								
Cresols, Total	< 0.40	5.0								
<i>Surr: 2,4,6-Tribromophenol</i>	95.63	5.0	100	0	95.6	39 - 153				
<i>Surr: 2-Fluorobiphenyl</i>	93.26	5.0	100	0	93.3	40 - 147				
<i>Surr: 2-Fluorophenol</i>	80.9	5.0	100	0	80.9	21 - 110				
<i>Surr: 4-Terphenyl-d14</i>	108.1	5.0	100	0	108	39 - 141				
<i>Surr: Nitrobenzene-d5</i>	93.53	5.0	100	0	93.5	37 - 140				
<i>Surr: Phenol-d6</i>	87.82	5.0	100	0	87.8	11 - 110				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133315		Instrument: SV-4		Method: SW8270						
LCS	Sample ID: LCS-133315	Units: ug/L			Analysis Date: 09-Oct-2018 17:04					
Client ID:	Run ID: SV-4_325100	SeqNo: 4765619		PrepDate: 09-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
2,4,5-Trichlorophenol	87.06	5.0	100	0	87.1	55 - 120				
2,4,6-Trichlorophenol	90.96	5.0	100	0	91.0	55 - 120				
2,4-Dinitrotoluene	50	5.0	50	0	100	55 - 125				
Hexachlorobenzene	49.86	5.0	50	0	99.7	55 - 120				
Hexachlorobutadiene	40.39	5.0	50	0	80.8	55 - 120				
Hexachloroethane	45.44	5.0	50	0	90.9	55 - 120				
Nitrobenzene	45.38	5.0	50	0	90.8	55 - 120				
Pentachlorophenol	87.4	5.0	100	0	87.4	50 - 135				
Pyridine	37.02	5.0	50	0	74.0	30 - 120				
Cresols, Total	281.3	5.0	250	0	113	48 - 115				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>106.5</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>107</i>	<i>39 - 153</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>84.65</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>84.6</i>	<i>40 - 147</i>				
<i>Surr: 2-Fluorophenol</i>	<i>99.87</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>99.9</i>	<i>21 - 110</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>97.77</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>97.8</i>	<i>39 - 141</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>93.28</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>93.3</i>	<i>37 - 140</i>				
<i>Surr: Phenol-d6</i>	<i>106.1</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>106</i>	<i>11 - 110</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133315		Instrument: SV-4		Method: SW8270						
LCSD	Sample ID: LCSD-133315	Units: ug/L			Analysis Date: 09-Oct-2018 17:26					
Client ID:	Run ID: SV-4_325100	SeqNo: 4765620		PrepDate: 09-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	95.57	5.0	100	0	95.6	55 - 120	87.06	9.32	30	
2,4,6-Trichlorophenol	92.79	5.0	100	0	92.8	55 - 120	90.96	1.99	30	
2,4-Dinitrotoluene	50.02	5.0	50	0	100	55 - 125	50	0.0401	30	
Hexachlorobenzene	49.44	5.0	50	0	98.9	55 - 120	49.86	0.838	30	
Hexachlorobutadiene	40.06	5.0	50	0	80.1	55 - 120	40.39	0.833	30	
Hexachloroethane	45.73	5.0	50	0	91.5	55 - 120	45.44	0.643	30	
Nitrobenzene	45.71	5.0	50	0	91.4	55 - 120	45.38	0.726	30	
Pentachlorophenol	91.85	5.0	100	0	91.9	50 - 135	87.4	4.97	30	
Pyridine	36.42	5.0	50	0	72.8	30 - 120	37.02	1.61	30	
Cresols, Total	280.5	5.0	250	0	112	48 - 115	281.3	0.286	30	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>106.7</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>107</i>	<i>39 - 153</i>	<i>106.5</i>	<i>0.217</i>	<i>30</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>85.08</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>85.1</i>	<i>40 - 147</i>	<i>84.65</i>	<i>0.511</i>	<i>30</i>	
<i>Surr: 2-Fluorophenol</i>	<i>99.34</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>99.3</i>	<i>21 - 110</i>	<i>99.87</i>	<i>0.534</i>	<i>30</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>96.67</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>96.7</i>	<i>39 - 141</i>	<i>97.77</i>	<i>1.13</i>	<i>30</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>93.19</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>93.2</i>	<i>37 - 140</i>	<i>93.28</i>	<i>0.0931</i>	<i>30</i>	
<i>Surr: Phenol-d6</i>	<i>109.6</i>	<i>5.0</i>	<i>100</i>	<i>0</i>	<i>110</i>	<i>11 - 110</i>	<i>106.1</i>	<i>3.3</i>	<i>30</i>	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133315		Instrument: SV-4		Method: SW8270						
MS	Sample ID: HS18100318-01MS	Units: ug/L			Analysis Date: 10-Oct-2018 12:37					
Client ID:	Run ID: SV-4_325100	SeqNo: 4766174	PrepDate: 09-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	82.54	5.1	102	0	80.9	55 - 120				
2,4,6-Trichlorophenol	87.93	5.1	102	0	86.2	55 - 120				
2,4-Dinitrotoluene	48.3	5.1	51.02	0	94.7	55 - 125				
Hexachlorobenzene	48.78	5.1	51.02	0	95.6	55 - 120				
Hexachlorobutadiene	36.89	5.1	51.02	0	72.3	55 - 120				
Hexachloroethane	41.24	5.1	51.02	0	80.8	55 - 120				
Nitrobenzene	41.95	5.1	51.02	0	82.2	55 - 120				
Pentachlorophenol	90.3	5.1	102	0	88.5	50 - 135				
Pyridine	38.47	5.1	51.02	0	75.4	30 - 120				
Cresols, Total	248.4	5.1	255.1	0	97.4	48 - 115				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>103.8</i>	<i>5.1</i>	<i>102</i>	<i>0</i>	<i>102</i>	<i>39 - 153</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>80.8</i>	<i>5.1</i>	<i>102</i>	<i>0</i>	<i>79.2</i>	<i>40 - 147</i>				
<i>Surr: 2-Fluorophenol</i>	<i>91.42</i>	<i>5.1</i>	<i>102</i>	<i>0</i>	<i>89.6</i>	<i>21 - 110</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>105.4</i>	<i>5.1</i>	<i>102</i>	<i>0</i>	<i>103</i>	<i>39 - 141</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>88.94</i>	<i>5.1</i>	<i>102</i>	<i>0</i>	<i>87.2</i>	<i>37 - 140</i>				
<i>Surr: Phenol-d6</i>	<i>105.9</i>	<i>5.1</i>	<i>102</i>	<i>0</i>	<i>104</i>	<i>11 - 110</i>				

The following samples were analyzed in this batch: HS18100316-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133269		Instrument: VOA9		Method: SW1311/8260B						
MBLK	Sample ID: MBLK-133269 100818	Units: ug/L			Analysis Date: 11-Oct-2018 04:44					
Client ID:	Run ID: VOA9_325190	SeqNo: 4767600		PrepDate: 09-Oct-2018		DF: 20				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
1,1-Dichloroethene	< 10	100								
1,2-Dichloroethane	< 10	100								
1,4-Dichlorobenzene	< 12	100								
2-Butanone	< 20	200								
Benzene	< 12	100								
Carbon tetrachloride	< 12	100								
Chlorobenzene	< 8.0	100								
Chloroform	< 12	100								
Tetrachloroethene	< 12	100								
Trichloroethene	< 10	100								
Vinyl chloride	< 8.0	40								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>908.1</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>90.8</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>937.1</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>93.7</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>854.3</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>85.4</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>1060</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>106</i>	<i>81 - 120</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133269		Instrument: VOA9			Method: SW1311/8260B					
LCS	Sample ID: VLCSW-133269 100818	Units: ug/L			Analysis Date: 12-Oct-2018 12:57					
Client ID:	Run ID: VOA6_325393			SeqNo: 4771828		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	20.35	5.0	20	0	102	70 - 130				
1,2-Dichloroethane	18.66	5.0	20	0	93.3	70 - 124				
1,4-Dichlorobenzene	22.68	5.0	20	0	113	79 - 113				S
2-Butanone	34.18	10	40	0	85.5	70 - 130				
Benzene	20.62	5.0	20	0	103	74 - 120				
Carbon tetrachloride	20.59	5.0	20	0	103	71 - 125				
Chlorobenzene	21.81	5.0	20	0	109	76 - 113				
Chloroform	19.38	5.0	20	0	96.9	71 - 121				
Tetrachloroethene	22.85	5.0	20	0	114	76 - 119				
Trichloroethene	21.63	5.0	20	0	108	77 - 121				
Vinyl chloride	19.26	2.0	20	0	96.3	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>41.08</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>82.2</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.46</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>96.9</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>45.59</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>91.2</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>47.57</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>95.1</i>	<i>81 - 120</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133269		Instrument: VOA9		Method: SW1311/8260B						
LCS	Sample ID: VLCSW-133269 100818	Units: ug/L			Analysis Date: 10-Oct-2018 23:45					
Client ID:	Run ID: VOA9_325190	SeqNo: 4767596		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,1-Dichloroethene	17.16	5.0	20	0	85.8	70 - 130				
1,2-Dichloroethane	19.03	5.0	20	0	95.1	70 - 124				
1,4-Dichlorobenzene	21.39	5.0	20	0	107	79 - 113				
2-Butanone	33.83	10	40	0	84.6	70 - 130				
Benzene	20.11	5.0	20	0	101	74 - 120				
Carbon tetrachloride	16.91	5.0	20	0	84.5	71 - 125				
Chlorobenzene	20	5.0	20	0	100.0	76 - 113				
Chloroform	18.08	5.0	20	0	90.4	71 - 121				
Tetrachloroethene	18.94	5.0	20	0	94.7	76 - 119				
Trichloroethene	18.89	5.0	20	0	94.4	77 - 121				
Vinyl chloride	19	2.0	20	0	95.0	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>43.6</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>87.2</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.99</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>100.0</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>45.24</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>90.5</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>53.41</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>107</i>	<i>81 - 120</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133269		Instrument: VOA9		Method: SW1311/8260B						
MS	Sample ID: HS18100597-01MS	Units: ug/L			Analysis Date: 12-Oct-2018 15:21					
Client ID:	Run ID: VOA6_325393	SeqNo: 4771831	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	22.35	5.0	20	0	112	70 - 130				
1,2-Dichloroethane	18.76	5.0	20	0	93.8	70 - 127				
1,4-Dichlorobenzene	24.52	5.0	20	0	123	70 - 114				S
2-Butanone	34.59	10	40	0	86.5	70 - 130				
Benzene	21.46	5.0	20	0	107	70 - 127				
Carbon tetrachloride	22.58	5.0	20	0	113	70 - 130				
Chlorobenzene	22.82	5.0	20	0	114	70 - 114				S
Chloroform	41.38	5.0	20	21.84	97.7	70 - 125				
Tetrachloroethene	25.43	5.0	20	0	127	70 - 130				
Trichloroethene	22.78	5.0	20	0	114	70 - 129				
Vinyl chloride	20.82	2.0	20	0	104	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>41.54</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>83.1</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.7</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>95.4</i>	<i>82 - 124</i>				
<i>Surr: Dibromofluoromethane</i>	<i>45.37</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>90.7</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>49.64</i>	<i>5.0</i>	<i>50</i>	<i>0</i>	<i>99.3</i>	<i>82 - 127</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: 133269		Instrument: VOA9		Method: SW1311/8260B						
MS	Sample ID: HS18081371-01MS	Units: ug/L			Analysis Date: 11-Oct-2018 01:50					
Client ID:	Run ID: VOA9_325190	SeqNo: 4767599	PrepDate:	DF: 20						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	391.7	100	400	0	97.9	70 - 130				
1,2-Dichloroethane	403.9	100	400	0	101	70 - 127				
1,4-Dichlorobenzene	404.2	100	400	0	101	70 - 114				
2-Butanone	693.6	200	800	0	86.7	70 - 130				
Benzene	422	100	400	0	106	70 - 127				
Carbon tetrachloride	364.7	100	400	0	91.2	70 - 130				
Chlorobenzene	402.1	100	400	0	101	70 - 114				
Chloroform	386.6	100	400	0	96.7	70 - 125				
Tetrachloroethene	381.1	100	400	0	95.3	70 - 130				
Trichloroethene	382.6	100	400	0	95.7	70 - 129				
Vinyl chloride	447.2	40	400	0	112	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>884.1</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>88.4</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>988.2</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>98.8</i>	<i>82 - 124</i>				
<i>Surr: Dibromofluoromethane</i>	<i>906</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>90.6</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>1070</i>	<i>100</i>	<i>1000</i>	<i>0</i>	<i>107</i>	<i>82 - 127</i>				

The following samples were analyzed in this batch: HS18100316-01

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
MBLK	Sample ID: VBLKS1-181015	Units: ug/Kg			Analysis Date: 15-Oct-2018 02:30					
Client ID:	Run ID: VOA5_325399	SeqNo: 4771995	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	< 0.50	5.0								
1,1,2,2-Tetrachloroethane	< 0.80	5.0								
1,1,2-Trichloroethane	< 0.50	5.0								
1,1-Dichloroethane	< 0.50	5.0								
1,1-Dichloroethene	< 0.50	5.0								
1,2-Dichlorobenzene	< 1.0	5.0								
1,2-Dichloroethane	< 0.60	5.0								
1,2-Dichloropropane	< 0.80	5.0								
1,3-Dichlorobenzene	< 1.0	5.0								
1,4-Dichlorobenzene	< 1.0	5.0								
2-Butanone	< 1.3	10								
2-Hexanone	< 1.4	10								
4-Methyl-2-pentanone	< 2.0	10								
Acetone	< 2.0	20								
Benzene	< 0.50	5.0								
Bromochloromethane	< 0.90	5.0								
Bromodichloromethane	< 0.50	5.0								
Bromoform	< 0.60	5.0								
Bromomethane	< 1.0	10								
Carbon disulfide	< 0.60	10								
Carbon tetrachloride	< 0.60	5.0								
Chlorobenzene	< 0.60	5.0								
Chloroethane	< 0.80	10								
Chloroform	< 0.50	5.0								
Chloromethane	< 0.50	10								
cis-1,2-Dichloroethene	< 0.80	5.0								
cis-1,3-Dichloropropene	< 0.50	5.0								
Dibromochloromethane	< 0.50	5.0								
Ethylbenzene	< 0.70	5.0								
m,p-Xylene	< 1.6	10								
Methylene chloride	< 1.0	10								
o-Xylene	< 1.0	5.0								
Styrene	< 0.70	5.0								
Tetrachloroethene	< 0.70	5.0								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260					
MBLK	Sample ID: VBLKS1-181015	Units: ug/Kg			Analysis Date: 15-Oct-2018 02:30				
Client ID:	Run ID: VOA5_325399	SeqNo: 4771995		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Toluene	< 0.60	5.0							
trans-1,2-Dichloroethene	< 0.50	5.0							
trans-1,3-Dichloropropene	< 0.60	5.0							
Trichloroethene	< 0.60	5.0							
Vinyl acetate	< 1.0	10							
Vinyl chloride	< 0.80	2.0							
Xylenes, Total	< 1.0	5.0							
1,2-Dichloroethene, Total	< 0.50	5.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.84</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>89.7</i>	<i>76 - 125</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.26</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>96.5</i>	<i>80 - 120</i>			
<i>Surr: Dibromofluoromethane</i>	<i>47.11</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>94.2</i>	<i>80 - 119</i>			
<i>Surr: Toluene-d8</i>	<i>49.44</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>81 - 118</i>			

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
LCS	Sample ID: VLCSS1-181015	Units: ug/Kg			Analysis Date: 15-Oct-2018 01:41					
Client ID:	Run ID: VOA5_325399	SeqNo: 4771994	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	47.26	5.0	50	0	94.5	72 - 130				
1,1,2,2-Tetrachloroethane	45.5	5.0	50	0	91.0	71 - 124				
1,1,2-Trichloroethane	46.42	5.0	50	0	92.8	78 - 117				
1,1-Dichloroethane	48.86	5.0	50	0	97.7	76 - 128				
1,1-Dichloroethene	47.3	5.0	50	0	94.6	72 - 130				
1,2-Dichlorobenzene	41.74	5.0	50	0	83.5	79 - 121				
1,2-Dichloroethane	48	5.0	50	0	96.0	77 - 120				
1,2-Dichloropropane	47.25	5.0	50	0	94.5	77 - 121				
1,3-Dichlorobenzene	42.3	5.0	50	0	84.6	78 - 121				
1,4-Dichlorobenzene	40.01	5.0	50	0	80.0	78 - 120				
2-Butanone	92.16	10	100	0	92.2	70 - 128				
2-Hexanone	92.89	10	100	0	92.9	72 - 127				
4-Methyl-2-pentanone	100.9	10	100	0	101	70 - 128				
Acetone	94.43	20	100	0	94.4	70 - 130				
Benzene	47.75	5.0	50	0	95.5	75 - 124				
Bromochloromethane	48.9	5.0	50	0	97.8	74 - 124				
Bromodichloromethane	48.64	5.0	50	0	97.3	78 - 122				
Bromoform	46.64	5.0	50	0	93.3	74 - 120				
Bromomethane	47.74	10	50	0	95.5	70 - 130				
Carbon disulfide	93.37	10	100	0	93.4	70 - 122				
Carbon tetrachloride	48.94	5.0	50	0	97.9	72 - 128				
Chlorobenzene	45.08	5.0	50	0	90.2	78 - 122				
Chloroethane	47.1	10	50	0	94.2	70 - 130				
Chloroform	48.76	5.0	50	0	97.5	73 - 127				
Chloromethane	48.21	10	50	0	96.4	70 - 130				
cis-1,2-Dichloroethene	48.05	5.0	50	0	96.1	77 - 125				
cis-1,3-Dichloropropene	46.35	5.0	50	0	92.7	78 - 122				
Dibromochloromethane	48.18	5.0	50	0	96.4	78 - 120				
Ethylbenzene	44.15	5.0	50	0	88.3	70 - 123				
m,p-Xylene	87.76	10	100	0	87.8	77 - 125				
Methylene chloride	42.33	10	50	0	84.7	71 - 125				
o-Xylene	43.48	5.0	50	0	87.0	78 - 122				
Styrene	44.93	5.0	50	0	89.9	80 - 123				
Tetrachloroethene	44.34	5.0	50	0	88.7	70 - 130				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
LCS	Sample ID: VLCSS1-181015	Units: ug/Kg			Analysis Date: 15-Oct-2018 01:41					
Client ID:	Run ID: VOA5_325399	SeqNo: 4771994		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	

Toluene	45.14	5.0	50	0	90.3	76 - 122			
trans-1,2-Dichloroethene	46.97	5.0	50	0	93.9	75 - 128			
trans-1,3-Dichloropropene	43.86	5.0	50	0	87.7	75 - 123			
Trichloroethene	48.39	5.0	50	0	96.8	78 - 125			
Vinyl acetate	74.61	10	100	0	74.6	70 - 130			
Vinyl chloride	51.17	2.0	50	0	102	70 - 130			
Xylenes, Total	131.2	5.0	150	0	87.5	77 - 128			
1,2-Dichloroethene, Total	95.03	5.0	100	0	95.0	75 - 128			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.34</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>98.7</i>	<i>76 - 125</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.02</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>98.0</i>	<i>80 - 120</i>			
<i>Surr: Dibromofluoromethane</i>	<i>49.7</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>99.4</i>	<i>80 - 119</i>			
<i>Surr: Toluene-d8</i>	<i>50.03</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 118</i>			

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
MS	Sample ID: HS18100636-21MS	Units: ug/Kg			Analysis Date: 15-Oct-2018 09:55					
Client ID:	Run ID: VOA5_325399	SeqNo: 4772050	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	56.34	4.8	48	0	117	70 - 130				
1,1,2,2-Tetrachloroethane	47.35	4.8	48	0	98.7	70 - 130				
1,1,2-Trichloroethane	44.17	4.8	48	0	92.0	70 - 130				
1,1-Dichloroethane	50.54	4.8	48	0	105	70 - 130				
1,1-Dichloroethene	50.69	4.8	48	0	106	70 - 130				
1,2-Dichlorobenzene	41.17	4.8	48	0	85.8	70 - 130				
1,2-Dichloroethane	45.69	4.8	48	0	95.2	70 - 130				
1,2-Dichloropropane	46.47	4.8	48	0	96.8	70 - 130				
1,3-Dichlorobenzene	45.02	4.8	48	0	93.8	70 - 130				
1,4-Dichlorobenzene	42.62	4.8	48	0	88.8	70 - 130				
2-Butanone	68.57	9.6	96	0	71.4	70 - 130				
2-Hexanone	75.4	9.6	96	0	78.5	70 - 130				
4-Methyl-2-pentanone	88.37	9.6	96	0	92.0	70 - 128				
Acetone	125	19	96	0	130	70 - 130				S
Benzene	51.63	4.8	48	0	108	70 - 130				
Bromochloromethane	46.58	4.8	48	0	97.0	70 - 130				
Bromodichloromethane	48.11	4.8	48	0	100	70 - 130				
Bromoform	40.73	4.8	48	0	84.9	70 - 130				
Bromomethane	66.93	9.6	48	0	139	70 - 130				S
Carbon disulfide	107.9	9.6	96	0	112	70 - 130				
Carbon tetrachloride	55.9	4.8	48	0	116	70 - 130				
Chlorobenzene	47.24	4.8	48	0	98.4	70 - 130				
Chloroethane	45.02	9.6	48	0	93.8	70 - 130				
Chloroform	49.7	4.8	48	0	104	70 - 130				
Chloromethane	53.72	9.6	48	0	112	70 - 130				
cis-1,2-Dichloroethene	47.61	4.8	48	0	99.2	70 - 130				
cis-1,3-Dichloropropene	48.65	4.8	48	0	101	70 - 130				
Dibromochloromethane	44.86	4.8	48	0	93.5	70 - 130				
Ethylbenzene	48.94	4.8	48	0	102	70 - 130				
m,p-Xylene	97.06	9.6	96	0	101	70 - 130				
Methylene chloride	44.5	9.6	48	0	92.7	70 - 130				
o-Xylene	46.08	4.8	48	0	96.0	70 - 130				
Styrene	46.42	4.8	48	0	96.7	70 - 130				
Tetrachloroethene	50.74	4.8	48	0	106	70 - 130				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
MS	Sample ID: HS18100636-21MS	Units: ug/Kg			Analysis Date: 15-Oct-2018 09:55					
Client ID:	Run ID: VOA5_325399	SeqNo: 4772050		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	50.34	4.8	48	0	105	70 - 130				
trans-1,2-Dichloroethene	54.1	4.8	48	0	113	70 - 130				
trans-1,3-Dichloropropene	41.11	4.8	48	0	85.6	70 - 130				
Trichloroethene	53.22	4.8	48	0	111	70 - 130				
Vinyl acetate	71.93	9.6	96	0	74.9	70 - 130				
Vinyl chloride	56.12	1.9	48	0	117	70 - 130				
Xylenes, Total	143.1	4.8	144	0	99.4	70 - 130				
1,2-Dichloroethene, Total	101.7	4.8	96	0	106	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.63</i>	<i>0</i>	<i>48</i>	<i>0</i>	<i>93.0</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>46.87</i>	<i>0</i>	<i>48</i>	<i>0</i>	<i>97.6</i>	<i>70 - 130</i>				
<i>Surr: Dibromofluoromethane</i>	<i>44.24</i>	<i>0</i>	<i>48</i>	<i>0</i>	<i>92.2</i>	<i>70 - 130</i>				
<i>Surr: Toluene-d8</i>	<i>48.9</i>	<i>0</i>	<i>48</i>	<i>0</i>	<i>102</i>	<i>70 - 130</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
MSD	Sample ID: HS18100636-21MSD	Units: ug/Kg			Analysis Date: 15-Oct-2018 10:20					
Client ID:	Run ID: VOA5_325399	SeqNo: 4772051	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	44.8	4.9	49	0	91.4	70 - 130	56.34	22.8	30	
1,1,2,2-Tetrachloroethane	36.92	4.9	49	0	75.4	70 - 130	47.35	24.8	30	
1,1,2-Trichloroethane	38.31	4.9	49	0	78.2	70 - 130	44.17	14.2	30	
1,1-Dichloroethane	41.59	4.9	49	0	84.9	70 - 130	50.54	19.4	30	
1,1-Dichloroethene	39.16	4.9	49	0	79.9	70 - 130	50.69	25.7	30	
1,2-Dichlorobenzene	28.04	4.9	49	0	57.2	70 - 130	41.17	38	30	SR
1,2-Dichloroethane	37.47	4.9	49	0	76.5	70 - 130	45.69	19.8	30	
1,2-Dichloropropane	38.54	4.9	49	0	78.7	70 - 130	46.47	18.7	30	
1,3-Dichlorobenzene	29.46	4.9	49	0	60.1	70 - 130	45.02	41.8	30	SR
1,4-Dichlorobenzene	28.57	4.9	49	0	58.3	70 - 130	42.62	39.5	30	SR
2-Butanone	58.51	9.8	98	0	59.7	70 - 130	68.57	15.8	30	S
2-Hexanone	67.44	9.8	98	0	68.8	70 - 130	75.4	11.2	30	S
4-Methyl-2-pentanone	98.25	9.8	98	0	100	70 - 128	88.37	10.6	30	
Acetone	139.3	20	98	0	142	70 - 130	125	10.8	30	S
Benzene	41.2	4.9	49	0	84.1	70 - 130	51.63	22.5	30	
Bromochloromethane	39.74	4.9	49	0	81.1	70 - 130	46.58	15.8	30	
Bromodichloromethane	37.71	4.9	49	0	77.0	70 - 130	48.11	24.2	30	
Bromoform	32.5	4.9	49	0	66.3	70 - 130	40.73	22.5	30	S
Bromomethane	47.61	9.8	49	0	97.2	70 - 130	66.93	33.7	30	R
Carbon disulfide	85.74	9.8	98	0	87.5	70 - 130	107.9	22.9	30	
Carbon tetrachloride	43.55	4.9	49	0	88.9	70 - 130	55.9	24.8	30	
Chlorobenzene	35.56	4.9	49	0	72.6	70 - 130	47.24	28.2	30	
Chloroethane	37.36	9.8	49	0	76.3	70 - 130	45.02	18.6	30	
Chloroform	39.51	4.9	49	0	80.6	70 - 130	49.7	22.9	30	
Chloromethane	45.23	9.8	49	0	92.3	70 - 130	53.72	17.2	30	
cis-1,2-Dichloroethene	38.46	4.9	49	0	78.5	70 - 130	47.61	21.3	30	
cis-1,3-Dichloropropene	38.89	4.9	49	0	79.4	70 - 130	48.65	22.3	30	
Dibromochloromethane	37.95	4.9	49	0	77.4	70 - 130	44.86	16.7	30	
Ethylbenzene	38.45	4.9	49	0	78.5	70 - 130	48.94	24	30	
m,p-Xylene	70.7	9.8	98	0	72.1	70 - 130	97.06	31.4	30	R
Methylene chloride	38.1	9.8	49	0	77.7	70 - 130	44.5	15.5	30	
o-Xylene	35.42	4.9	49	0	72.3	70 - 130	46.08	26.2	30	
Styrene	34.05	4.9	49	0	69.5	70 - 130	46.42	30.8	30	SR
Tetrachloroethene	38.2	4.9	49	0	78.0	70 - 130	50.74	28.2	30	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325399		Instrument: VOA5		Method: SW8260						
MSD	Sample ID: HS18100636-21MSD	Units: ug/Kg			Analysis Date: 15-Oct-2018 10:20					
Client ID:	Run ID: VOA5_325399	SeqNo: 4772051		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	39.31	4.9	49	0	80.2	70 - 130	50.34	24.6	30	
trans-1,2-Dichloroethene	41.4	4.9	49	0	84.5	70 - 130	54.1	26.6	30	
trans-1,3-Dichloropropene	35.2	4.9	49	0	71.8	70 - 130	41.11	15.5	30	
Trichloroethene	40.42	4.9	49	0	82.5	70 - 130	53.22	27.3	30	
Vinyl acetate	48.73	9.8	98	0	49.7	70 - 130	71.93	38.5	30	SR
Vinyl chloride	47.34	2.0	49	0	96.6	70 - 130	56.12	17	30	
Xylenes, Total	106.1	4.9	147	0	72.2	70 - 130	143.1	29.7	30	
1,2-Dichloroethene, Total	79.85	4.9	98	0	81.5	70 - 130	101.7	24.1	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.81</i>	<i>0</i>	<i>49</i>	<i>0</i>	<i>93.5</i>	<i>70 - 126</i>	<i>44.63</i>	<i>2.62</i>	<i>30</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.37</i>	<i>0</i>	<i>49</i>	<i>0</i>	<i>98.7</i>	<i>70 - 130</i>	<i>46.87</i>	<i>3.15</i>	<i>30</i>	
<i>Surr: Dibromofluoromethane</i>	<i>45.79</i>	<i>0</i>	<i>49</i>	<i>0</i>	<i>93.4</i>	<i>70 - 130</i>	<i>44.24</i>	<i>3.43</i>	<i>30</i>	
<i>Surr: Toluene-d8</i>	<i>50.21</i>	<i>0</i>	<i>49</i>	<i>0</i>	<i>102</i>	<i>70 - 130</i>	<i>48.9</i>	<i>2.64</i>	<i>30</i>	

The following samples were analyzed in this batch: HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325036		Instrument: WetChem_HS		Method: SW7.3.4.2	
MBLK	Sample ID: MBLK-325036	Units: mg/Kg		Analysis Date: 09-Oct-2018 13:45	
Client ID:	Run ID: WetChem_HS_325036	SeqNo: 4763994	PrepDate:	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC Control Limit RPD Ref Value %RPD Limit Qual
Reactive Sulfide	< 100	100			
LCS	Sample ID: LCS-325036	Units: mg/Kg		Analysis Date: 09-Oct-2018 13:45	
Client ID:	Run ID: WetChem_HS_325036	SeqNo: 4763995	PrepDate:	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC Control Limit RPD Ref Value %RPD Limit Qual
Reactive Sulfide	68	10.0	100	0	68.0 20 - 120
MS	Sample ID: HS18100003-06MS	Units: mg/Kg		Analysis Date: 09-Oct-2018 13:45	
Client ID:	Run ID: WetChem_HS_325036	SeqNo: 4763997	PrepDate:	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC Control Limit RPD Ref Value %RPD Limit Qual
Reactive Sulfide	60	10.0	100	0	60.0 20 - 120

The following samples were analyzed in this batch: HS18100316-01 HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325039	Instrument: UV-2450	Method: SW7.3.3.2
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MBLK	Sample ID: MBLK-325039	Units: mg/Kg	Analysis Date: 09-Oct-2018 14:15							
Client ID:	Run ID: UV-2450_325039	SeqNo: 4764056	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Reactive Cyanide < 100 100

LCS	Sample ID: LCS-325039	Units: mg/Kg	Analysis Date: 09-Oct-2018 14:15							
Client ID:	Run ID: UV-2450_325039	SeqNo: 4764057	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Reactive Cyanide 0.7 10.0 10 0 7.00 5 - 100 J

MS	Sample ID: HS18100003-06MS	Units: mg/Kg	Analysis Date: 09-Oct-2018 14:15							
Client ID:	Run ID: UV-2450_325039	SeqNo: 4764059	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Reactive Cyanide 0.69 10.0 10 0.03 6.60 5 - 100 J

The following samples were analyzed in this batch: HS18100316-01 HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325118		Instrument: WetChem_HS		Method: SW9045B						
DUP	Sample ID: HS18100359-03DUP	Units: pH Units		Analysis Date: 10-Oct-2018 13:15						
Client ID:	Run ID: WetChem_HS_325118	SeqNo: 4766011		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH	8.04	0.100					8.05	0.124	10	
Temp Deg C @pH	21	0					21	0	10	

The following samples were analyzed in this batch: HS18100316-01 HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

QC BATCH REPORT

Batch ID: R325139 **Instrument:** Balance1 **Method:** SW1030

DUP	Sample ID: HS18100136-01DUP	Units: Burn Rate, mm/sec	Analysis Date: 10-Oct-2018 15:00							
Client ID:	Run ID: Balance1_325139	SeqNo: 4766550	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ignitability, Solid	Negative	0					0	0	25	
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The following samples were analyzed in this batch: HS18100316-01 HS18100316-02

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100316

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
Date	
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: PBW
 Work Order: HS18100316

Date/Time Received: **05-Oct-2018 16:11**
 Received by: **JRM**

Checklist completed by: Jared R. Makan 5-Oct-2018
 eSignature Date
 Reviewed by: Dane J. Wacasey 9-Oct-2018
 eSignature Date

Matrices: **Soil** Carrier name: **ALS Courier**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- TX1005 solids received in hermetically sealed vials? Yes No N/A
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

Corrective Action:



Cincinnati, OH
+1 513 733 5336

Fort Collins, CO
+1 970 490 1511

Everett, WA
+1 425 356 2600

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 189277

HS18100316

WV

Golder Associates Inc.

Houston TX-Wood Preserving Works



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-12-Rev0 SR 92688
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive	Address	1400 Douglas Street
	Suite 4004		Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	Eric_Matzner@golder.com	e-Mail Address	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-TPSoils-20181005	10/5/18	10:30 AM	Soil	8	3	X	X	X	X			X	X	X		
2	SO-1620-TPSoil(2-3)-20181005	10/5/18	8:00 AM	Soil	8	1	X	X	X	X	X	X	X	X	X		
3	NAPL-1620-TPB105-20181005		7:30 AM	Product	8	2			X		X	X	X	X	X	X	
4	NAPL-1620-TPB100-20181005		8:00 AM	Product	8	2			X		X	X	X	X	X	X	
5	NAPL-1620-TPB54-20181005		8:00 AM	Product	8	1			X		X	X	X	X	X	X	
6	NAPL-1620-TPB13-20181005		8:45 AM	Product	8	2			X		X	X	X	X	X	X	
7											X	X	X	X	X	X	
8																	
9																	
10																	

Sampler(s) Please Print & Sign

Relinquished by: Bryan Luper Date: 10/5/18 Time: 1:54

Relinquished by: Bryan Luper Date: 10/5/18 Time: 1:54

Shipment Method: HAND DELIVER

Required Turnaround Time: (Check Box) 10 NAPL STD 10 Wk Days 5 Wk Days 2 Wk Days 24 Hour

Results Due Date: SOIL 3 DAY TAT

Notes: UPRR Houston MWPW

QC Package: (Check One Box Below)

Level II Std QC TRRP Checklist 10/5/18

Level III Std QC/Raw Date TRRP Level IV

Level IV SW846/CLP

Preservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

ote: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. (R25 cf to 0.3%)
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

October 22, 2018

Eric Matzner
Golder Associates Inc.
2201 Double Creek Drive
Suite 4004
Round Rock, TX 78664

Work Order: **HS18100321**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 4 sample(s) on Oct 05, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
Dane J. Wacasey

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100321

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18100321-01	NAPL-1620-TPB105-20181005	Product		05-Oct-2018 07:00	05-Oct-2018 15:40	<input type="checkbox"/>
HS18100321-02	NAPL-1620-TPB100-20181005	Product		05-Oct-2018 08:00	05-Oct-2018 15:40	<input type="checkbox"/>
HS18100321-03	NAPL-1620-TPB54-20181005	Product		05-Oct-2018 08:00	05-Oct-2018 15:40	<input type="checkbox"/>
HS18100321-04	NAPL-1620-TPB13-20181005	Product		05-Oct-2018 08:45	05-Oct-2018 15:40	<input type="checkbox"/>

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100321

CASE NARRATIVE

Work Order Comments

- Sample received outside method holding time for pH. pH is an immediate test. Sample results are flagged with an "H" qualifier.
The temperature at the time of pH is reported. Please note that all pH results are already normalized to a temperature of 25 °C.

GC Semivolatiles by Method TX1006**Batch ID: 133411**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GC Semivolatiles by Method TX1005**Batch ID: 133256****Sample ID: NAPL-1620-TPB105-20181005 (HS18100321-01)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: NAPL-1620-TPB105-20181005 (HS18100321-01MS/MSD)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (>nC12 to nC28)
- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: NAPL-1620-TPB13-20181005 (HS18100321-04)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: NAPL-1620-TPB54-20181005 (HS18100321-03)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: NAPL-1620-TPB100-20181005 (HS18100321-02)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

GCMS Semivolatiles by Method SW8270**Batch ID: 133297****Sample ID: HS18100338-02MS**

- MS and MSD are for an unrelated sample

Sample ID: NAPL-1620-TPB100-20181005 (HS18100321-02)

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

Sample ID: NAPL-1620-TPB54-20181005 (HS18100321-03)

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

GCMS Volatiles by Method SW8260**Batch ID: R325468****Sample ID: HS18100374-01MS**

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100321

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R325468

- MS and MSD are for an unrelated sample

Sample ID: NAPL-1620-TPB105-20181005 (HS18100321-01), NAPL-1620-TPB100-20181005 (HS18100321-02), NAPL-1620-TPB54-20181005 (HS18100321-03), NAPL-1620-TPB13-20181005 (HS18100321-04)

- Lowest practical dilution for HS1810321-01-04 due to sample matrix.
-

WetChemistry by Method SW7.3.3.2

Batch ID: R325337

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW1030

Batch ID: R325453

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW7.3.4.2

Batch ID: R325330

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

WetChemistry by Method SW9045B

Batch ID: R325118

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB105-20181005
 Collection Date: 05-Oct-2018 07:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-01
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
1,1,1-Trichloroethane	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
1,1,2,2-Tetrachloroethane	< 0.0074		0.0074	0.046	mg/Kg	10	15-Oct-2018 23:29
1,1,2-Trichloroethane	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
1,1-Dichloroethane	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
1,1-Dichloroethene	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
1,2-Dichlorobenzene	< 0.0092		0.0092	0.046	mg/Kg	10	15-Oct-2018 23:29
1,2-Dichloroethane	< 0.0055		0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
1,2-Dichloropropane	< 0.0074		0.0074	0.046	mg/Kg	10	15-Oct-2018 23:29
1,3-Dichlorobenzene	< 0.0092		0.0092	0.046	mg/Kg	10	15-Oct-2018 23:29
1,4-Dichlorobenzene	< 0.0092		0.0092	0.046	mg/Kg	10	15-Oct-2018 23:29
2-Butanone	< 0.012		0.012	0.092	mg/Kg	10	15-Oct-2018 23:29
2-Hexanone	< 0.013		0.013	0.092	mg/Kg	10	15-Oct-2018 23:29
4-Methyl-2-pentanone	< 0.018		0.018	0.092	mg/Kg	10	15-Oct-2018 23:29
Acetone	0.20		0.018	0.18	mg/Kg	10	15-Oct-2018 23:29
Benzene	0.012	J	0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
Bromochloromethane	< 0.0083		0.0083	0.046	mg/Kg	10	15-Oct-2018 23:29
Bromodichloromethane	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
Bromoform	< 0.0055		0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
Bromomethane	< 0.0092		0.0092	0.092	mg/Kg	10	15-Oct-2018 23:29
Carbon disulfide	< 0.0055		0.0055	0.092	mg/Kg	10	15-Oct-2018 23:29
Carbon tetrachloride	< 0.0055		0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
Chlorobenzene	< 0.0055		0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
Chloroethane	< 0.0074		0.0074	0.092	mg/Kg	10	15-Oct-2018 23:29
Chloroform	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
Chloromethane	< 0.0046		0.0046	0.092	mg/Kg	10	15-Oct-2018 23:29
cis-1,2-Dichloroethene	< 0.0074		0.0074	0.046	mg/Kg	10	15-Oct-2018 23:29
cis-1,3-Dichloropropene	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
Dibromochloromethane	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
Ethylbenzene	0.092		0.0064	0.046	mg/Kg	10	15-Oct-2018 23:29
m,p-Xylene	0.031	J	0.015	0.092	mg/Kg	10	15-Oct-2018 23:29
Methylene chloride	< 0.0092		0.0092	0.092	mg/Kg	10	15-Oct-2018 23:29
o-Xylene	0.051		0.0092	0.046	mg/Kg	10	15-Oct-2018 23:29
Styrene	< 0.0064		0.0064	0.046	mg/Kg	10	15-Oct-2018 23:29
Tetrachloroethene	< 0.0064		0.0064	0.046	mg/Kg	10	15-Oct-2018 23:29
Toluene	0.029	J	0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
trans-1,2-Dichloroethene	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
trans-1,3-Dichloropropene	< 0.0055		0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
Trichloroethene	< 0.0055		0.0055	0.046	mg/Kg	10	15-Oct-2018 23:29
Vinyl acetate	< 0.0092		0.0092	0.092	mg/Kg	10	15-Oct-2018 23:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB105-20181005
 Collection Date: 05-Oct-2018 07:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-01
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
Vinyl chloride	< 0.0074		0.0074	0.018	mg/Kg	10	15-Oct-2018 23:29
Xylenes, Total	0.082		0.0092	0.046	mg/Kg	10	15-Oct-2018 23:29
1,2-Dichloroethene, Total	< 0.0046		0.0046	0.046	mg/Kg	10	15-Oct-2018 23:29
Surr: 1,2-Dichloroethane-d4	81.0			70-126	%REC	10	15-Oct-2018 23:29
Surr: 4-Bromofluorobenzene	97.5			70-130	%REC	10	15-Oct-2018 23:29
Surr: Dibromofluoromethane	93.7			70-130	%REC	10	15-Oct-2018 23:29
Surr: Toluene-d8	104			70-130	%REC	10	15-Oct-2018 23:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB105-20181005
 Collection Date: 05-Oct-2018 07:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-01
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270			Prep:SW3541 / 08-Oct-2018		Analyst: ACN
1,2,4-Trichlorobenzene	< 0.0072		0.0072	0.039	mg/Kg	1	12-Oct-2018 20:00
2,4,5-Trichlorophenol	< 0.015		0.015	0.039	mg/Kg	1	12-Oct-2018 20:00
2,4,6-Trichlorophenol	< 0.010		0.010	0.039	mg/Kg	1	12-Oct-2018 20:00
2,4-Dichlorophenol	< 0.0078		0.0078	0.039	mg/Kg	1	12-Oct-2018 20:00
2,4-Dimethylphenol	< 0.020		0.020	0.039	mg/Kg	1	12-Oct-2018 20:00
2,4-Dinitrophenol	< 0.027		0.027	0.079	mg/Kg	1	12-Oct-2018 20:00
2,4-Dinitrotoluene	< 0.0054		0.0054	0.039	mg/Kg	1	12-Oct-2018 20:00
2,6-Dinitrotoluene	< 0.020		0.020	0.039	mg/Kg	1	12-Oct-2018 20:00
2-Chloronaphthalene	< 0.0078		0.0078	0.039	mg/Kg	1	12-Oct-2018 20:00
2-Chlorophenol	< 0.0078		0.0078	0.039	mg/Kg	1	12-Oct-2018 20:00
2-Methylnaphthalene	0.021		0.0030	0.020	mg/Kg	1	12-Oct-2018 20:00
2-Methylphenol	< 0.0066		0.0066	0.039	mg/Kg	1	12-Oct-2018 20:00
2-Nitroaniline	< 0.011		0.011	0.039	mg/Kg	1	12-Oct-2018 20:00
2-Nitrophenol	< 0.015		0.015	0.039	mg/Kg	1	12-Oct-2018 20:00
3&4-Methylphenol	< 0.0060		0.0060	0.039	mg/Kg	1	12-Oct-2018 20:00
3,3'-Dichlorobenzidine	< 0.015		0.015	0.039	mg/Kg	1	12-Oct-2018 20:00
3-Nitroaniline	< 0.011		0.011	0.039	mg/Kg	1	12-Oct-2018 20:00
4,6-Dinitro-2-methylphenol	< 0.013		0.013	0.039	mg/Kg	1	12-Oct-2018 20:00
4-Bromophenyl phenyl ether	< 0.0096		0.0096	0.039	mg/Kg	1	12-Oct-2018 20:00
4-Chloro-3-methylphenol	< 0.0042		0.0042	0.039	mg/Kg	1	12-Oct-2018 20:00
4-Chloroaniline	< 0.0066		0.0066	0.039	mg/Kg	1	12-Oct-2018 20:00
4-Chlorophenyl phenyl ether	< 0.0090		0.0090	0.039	mg/Kg	1	12-Oct-2018 20:00
4-Nitroaniline	< 0.013		0.013	0.039	mg/Kg	1	12-Oct-2018 20:00
4-Nitrophenol	< 0.011		0.011	0.079	mg/Kg	1	12-Oct-2018 20:00
Acenaphthene	0.086		0.0030	0.020	mg/Kg	1	12-Oct-2018 20:00
Acenaphthylene	0.11		0.0060	0.020	mg/Kg	1	12-Oct-2018 20:00
Anthracene	0.32		0.0030	0.020	mg/Kg	1	12-Oct-2018 20:00
Benz(a)anthracene	1.4		0.0096	0.020	mg/Kg	1	12-Oct-2018 20:00
Benzidine	< 0.0084		0.0084	0.039	mg/Kg	1	12-Oct-2018 20:00
Benzo(a)pyrene	1.2		0.0060	0.020	mg/Kg	1	12-Oct-2018 20:00
Benzo(b)fluoranthene	1.5		0.0072	0.020	mg/Kg	1	12-Oct-2018 20:00
Benzo(g,h,i)perylene	0.88		0.0042	0.020	mg/Kg	1	12-Oct-2018 20:00
Benzo(k)fluoranthene	0.81		0.0054	0.020	mg/Kg	1	12-Oct-2018 20:00
Benzyl alcohol	< 0.0042		0.0042	0.039	mg/Kg	1	12-Oct-2018 20:00
Bis(2-chloro-1-methylethyl) ether	< 0.0084		0.0084	0.039	mg/Kg	1	12-Oct-2018 20:00
Bis(2-chloroethoxy)methane	< 0.0054		0.0054	0.039	mg/Kg	1	12-Oct-2018 20:00
Bis(2-chloroethyl)ether	< 0.0066		0.0066	0.039	mg/Kg	1	12-Oct-2018 20:00
Bis(2-ethylhexyl)phthalate	< 0.010		0.010	0.039	mg/Kg	1	12-Oct-2018 20:00
Butyl benzyl phthalate	< 0.0078		0.0078	0.039	mg/Kg	1	12-Oct-2018 20:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB105-20181005
 Collection Date: 05-Oct-2018 07:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-01
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270			Prep:SW3541 / 08-Oct-2018		Analyst: ACN
Carbazole	0.13		0.0072	0.039	mg/Kg	1	12-Oct-2018 20:00
Chrysene	1.6		0.0048	0.020	mg/Kg	1	12-Oct-2018 20:00
Dibenz(a,h)anthracene	0.23		0.0096	0.020	mg/Kg	1	12-Oct-2018 20:00
Dibenzofuran	0.050		0.0042	0.020	mg/Kg	1	12-Oct-2018 20:00
Diethyl phthalate	< 0.0060		0.0060	0.039	mg/Kg	1	12-Oct-2018 20:00
Dimethyl phthalate	< 0.0048		0.0048	0.039	mg/Kg	1	12-Oct-2018 20:00
Di-n-butyl phthalate	0.10		0.0072	0.039	mg/Kg	1	12-Oct-2018 20:00
Di-n-octyl phthalate	< 0.0054		0.0054	0.039	mg/Kg	1	12-Oct-2018 20:00
Fluoranthene	1.0		0.066	0.20	mg/Kg	10	11-Oct-2018 20:06
Fluorene	0.084		0.0066	0.020	mg/Kg	1	12-Oct-2018 20:00
Hexachlorobenzene	< 0.0054		0.0054	0.039	mg/Kg	1	12-Oct-2018 20:00
Hexachlorobutadiene	< 0.0072		0.0072	0.039	mg/Kg	1	12-Oct-2018 20:00
Hexachlorocyclopentadiene	< 0.0048		0.0048	0.039	mg/Kg	1	12-Oct-2018 20:00
Hexachloroethane	< 0.0090		0.0090	0.039	mg/Kg	1	12-Oct-2018 20:00
Indeno(1,2,3-cd)pyrene	0.88		0.0048	0.020	mg/Kg	1	12-Oct-2018 20:00
Isophorone	< 0.0048		0.0048	0.039	mg/Kg	1	12-Oct-2018 20:00
Naphthalene	0.032		0.0036	0.020	mg/Kg	1	12-Oct-2018 20:00
Nitrobenzene	< 0.0054		0.0054	0.039	mg/Kg	1	12-Oct-2018 20:00
N-Nitrosodimethylamine	< 0.0072		0.0072	0.039	mg/Kg	1	12-Oct-2018 20:00
N-Nitrosodi-n-propylamine	< 0.0066		0.0066	0.039	mg/Kg	1	12-Oct-2018 20:00
N-Nitrosodiphenylamine	< 0.0042		0.0042	0.039	mg/Kg	1	12-Oct-2018 20:00
Pentachlorophenol	< 0.020		0.020	0.039	mg/Kg	1	12-Oct-2018 20:00
Phenanthrene	2.0		0.0090	0.020	mg/Kg	1	12-Oct-2018 20:00
Phenol	< 0.0066		0.0066	0.039	mg/Kg	1	12-Oct-2018 20:00
Pyrene	0.87		0.036	0.20	mg/Kg	10	11-Oct-2018 20:06
Surr: 2,4,6-Tribromophenol	79.7			36-126	%REC	10	11-Oct-2018 20:06
Surr: 2,4,6-Tribromophenol	57.2			36-126	%REC	1	12-Oct-2018 20:00
Surr: 2-Fluorobiphenyl	91.7			43-125	%REC	10	11-Oct-2018 20:06
Surr: 2-Fluorobiphenyl	59.1			43-125	%REC	1	12-Oct-2018 20:00
Surr: 2-Fluorophenol	52.5			37-125	%REC	1	12-Oct-2018 20:00
Surr: 2-Fluorophenol	80.2			37-125	%REC	10	11-Oct-2018 20:06
Surr: 4-Terphenyl-d14	105			32-125	%REC	10	11-Oct-2018 20:06
Surr: 4-Terphenyl-d14	66.5			32-125	%REC	1	12-Oct-2018 20:00
Surr: Nitrobenzene-d5	60.2			37-125	%REC	1	12-Oct-2018 20:00
Surr: Nitrobenzene-d5	92.6			37-125	%REC	10	11-Oct-2018 20:06
Surr: Phenol-d6	79.4			40-125	%REC	10	11-Oct-2018 20:06
Surr: Phenol-d6	56.8			40-125	%REC	1	12-Oct-2018 20:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB105-20181005
 Collection Date: 05-Oct-2018 07:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-01
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TEXAS TPH BY TX1005		Method:TX1005		Prep:TX1005PR / 08-Oct-2018		Analyst: MBG	
nC6 to nC12	5,000		730	4900	mg/Kg	100	08-Oct-2018 18:46
>nC12 to nC28	17,000		960	4900	mg/Kg	100	08-Oct-2018 18:46
>nC28 to nC35	2,100	J	960	4900	mg/Kg	100	08-Oct-2018 18:46
Total Petroleum Hydrocarbon	24,100		730	4900	mg/Kg	100	08-Oct-2018 18:46
Surr: 2-Fluorobiphenyl	0	S		70-130	%REC	100	08-Oct-2018 18:46
Surr: Trifluoromethyl benzene	0	S		70-130	%REC	100	08-Oct-2018 18:46
PETROLEUM HYDROCARBONS BY TX1006		Method:TX1006		Prep:TX1006PR / 11-Oct-2018		Analyst: MBG	
Aliphatics nC6	< 4.9	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics >nC6 to nC8	< 4.9	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics >nC8 to nC10	< 4.9	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics >nC10 to nC12	< 4.9	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics >nC12 to nC16	< 4.9	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics >nC16 to nC21	19	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics >nC21 to nC35	34	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Total Aliphatic Fraction	53.0	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
Aliphatics Relative % Distribution	30	n	0	0	%	1	12-Oct-2018 04:28
Aromatics >nC7 to nC8	< 490	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Aromatics >nC8 to nC10	< 490	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Aromatics >nC10 to nC12	< 490	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Aromatics >nC12 to nC16	1,000	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Aromatics >nC16 to nC21	5,400	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Aromatics >nC21 to nC35	5,700	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Total Aromatic Fraction	12,100	n	490	990	mg/Kg	100	11-Oct-2018 22:40
Aromatics Relative % Distribution	70	n	0	0	%	100	11-Oct-2018 22:40
Total Petroleum Hydrocarbons	12,153	n	4.9	9.9	mg/Kg	1	12-Oct-2018 04:28
BURN RATE BY METHOD SW1030		Method:SW1030				Analyst: KAH	
Ignitability, Solid	Negative		0	0	Burn Rate, mm/sec	1	15-Oct-2018 14:00
REACTIVE CYANIDE		Method:SW7.3.3.2		Prep:SW7.3.3.2		Analyst: MZD	
Reactive Cyanide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 13:30
REACTIVE SULFIDE		Method:SW7.3.4.2				Analyst: MZD	
Reactive Sulfide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 11:30
PH SOIL BY SW9045D		Method:SW9045B				Analyst: MZD	
pH	8.97	H	0.100	0.100	pH Units	1	10-Oct-2018 13:15
Temp Deg C @pH	21.1	H	0	0	°C	1	10-Oct-2018 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB100-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-02
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
1,1,1-Trichloroethane	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
1,1,2,2-Tetrachloroethane	< 0.0070		0.0070	0.044	mg/Kg	10	15-Oct-2018 23:54
1,1,2-Trichloroethane	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
1,1-Dichloroethane	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
1,1-Dichloroethene	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
1,2-Dichlorobenzene	< 0.0088		0.0088	0.044	mg/Kg	10	15-Oct-2018 23:54
1,2-Dichloroethane	< 0.0053		0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
1,2-Dichloropropane	< 0.0070		0.0070	0.044	mg/Kg	10	15-Oct-2018 23:54
1,3-Dichlorobenzene	< 0.0088		0.0088	0.044	mg/Kg	10	15-Oct-2018 23:54
1,4-Dichlorobenzene	< 0.0088		0.0088	0.044	mg/Kg	10	15-Oct-2018 23:54
2-Butanone	< 0.011		0.011	0.088	mg/Kg	10	15-Oct-2018 23:54
2-Hexanone	< 0.012		0.012	0.088	mg/Kg	10	15-Oct-2018 23:54
4-Methyl-2-pentanone	< 0.018		0.018	0.088	mg/Kg	10	15-Oct-2018 23:54
Acetone	0.23		0.018	0.18	mg/Kg	10	15-Oct-2018 23:54
Benzene	0.017	J	0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
Bromochloromethane	< 0.0079		0.0079	0.044	mg/Kg	10	15-Oct-2018 23:54
Bromodichloromethane	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
Bromoform	< 0.0053		0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
Bromomethane	< 0.0088		0.0088	0.088	mg/Kg	10	15-Oct-2018 23:54
Carbon disulfide	< 0.0053		0.0053	0.088	mg/Kg	10	15-Oct-2018 23:54
Carbon tetrachloride	< 0.0053		0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
Chlorobenzene	< 0.0053		0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
Chloroethane	< 0.0070		0.0070	0.088	mg/Kg	10	15-Oct-2018 23:54
Chloroform	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
Chloromethane	< 0.0044		0.0044	0.088	mg/Kg	10	15-Oct-2018 23:54
cis-1,2-Dichloroethene	< 0.0070		0.0070	0.044	mg/Kg	10	15-Oct-2018 23:54
cis-1,3-Dichloropropene	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
Dibromochloromethane	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
Ethylbenzene	0.21		0.0062	0.044	mg/Kg	10	15-Oct-2018 23:54
m,p-Xylene	0.048	J	0.014	0.088	mg/Kg	10	15-Oct-2018 23:54
Methylene chloride	< 0.0088		0.0088	0.088	mg/Kg	10	15-Oct-2018 23:54
o-Xylene	0.11		0.0088	0.044	mg/Kg	10	15-Oct-2018 23:54
Styrene	< 0.0062		0.0062	0.044	mg/Kg	10	15-Oct-2018 23:54
Tetrachloroethene	< 0.0062		0.0062	0.044	mg/Kg	10	15-Oct-2018 23:54
Toluene	0.038	J	0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
trans-1,2-Dichloroethene	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
trans-1,3-Dichloropropene	< 0.0053		0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
Trichloroethene	< 0.0053		0.0053	0.044	mg/Kg	10	15-Oct-2018 23:54
Vinyl acetate	< 0.0088		0.0088	0.088	mg/Kg	10	15-Oct-2018 23:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB100-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-02
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
Vinyl chloride	< 0.0070		0.0070	0.018	mg/Kg	10	15-Oct-2018 23:54
Xylenes, Total	0.16		0.0088	0.044	mg/Kg	10	15-Oct-2018 23:54
1,2-Dichloroethene, Total	< 0.0044		0.0044	0.044	mg/Kg	10	15-Oct-2018 23:54
Surr: 1,2-Dichloroethane-d4	83.0			70-126	%REC	10	15-Oct-2018 23:54
Surr: 4-Bromofluorobenzene	98.1			70-130	%REC	10	15-Oct-2018 23:54
Surr: Dibromofluoromethane	96.0			70-130	%REC	10	15-Oct-2018 23:54
Surr: Toluene-d8	104			70-130	%REC	10	15-Oct-2018 23:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB100-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-02
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270			Prep:SW3541 / 08-Oct-2018		Analyst: ACN
1,2,4-Trichlorobenzene	< 0.071		0.071	0.39	mg/Kg	10	12-Oct-2018 20:20
2,4,5-Trichlorophenol	< 0.15		0.15	0.39	mg/Kg	10	12-Oct-2018 20:20
2,4,6-Trichlorophenol	< 0.10		0.10	0.39	mg/Kg	10	12-Oct-2018 20:20
2,4-Dichlorophenol	< 0.077		0.077	0.39	mg/Kg	10	12-Oct-2018 20:20
2,4-Dimethylphenol	< 0.20		0.20	0.39	mg/Kg	10	12-Oct-2018 20:20
2,4-Dinitrophenol	< 0.27		0.27	0.78	mg/Kg	10	12-Oct-2018 20:20
2,4-Dinitrotoluene	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 20:20
2,6-Dinitrotoluene	< 0.20		0.20	0.39	mg/Kg	10	12-Oct-2018 20:20
2-Chloronaphthalene	< 0.077		0.077	0.39	mg/Kg	10	12-Oct-2018 20:20
2-Chlorophenol	< 0.077		0.077	0.39	mg/Kg	10	12-Oct-2018 20:20
2-Methylnaphthalene	< 0.030		0.030	0.20	mg/Kg	10	12-Oct-2018 20:20
2-Methylphenol	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 20:20
2-Nitroaniline	< 0.11		0.11	0.39	mg/Kg	10	12-Oct-2018 20:20
2-Nitrophenol	< 0.15		0.15	0.39	mg/Kg	10	12-Oct-2018 20:20
3&4-Methylphenol	< 0.059		0.059	0.39	mg/Kg	10	12-Oct-2018 20:20
3,3'-Dichlorobenzidine	< 0.15		0.15	0.39	mg/Kg	10	12-Oct-2018 20:20
3-Nitroaniline	< 0.11		0.11	0.39	mg/Kg	10	12-Oct-2018 20:20
4,6-Dinitro-2-methylphenol	< 0.12		0.12	0.39	mg/Kg	10	12-Oct-2018 20:20
4-Bromophenyl phenyl ether	< 0.095		0.095	0.39	mg/Kg	10	12-Oct-2018 20:20
4-Chloro-3-methylphenol	< 0.042		0.042	0.39	mg/Kg	10	12-Oct-2018 20:20
4-Chloroaniline	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 20:20
4-Chlorophenyl phenyl ether	< 0.089		0.089	0.39	mg/Kg	10	12-Oct-2018 20:20
4-Nitroaniline	< 0.13		0.13	0.39	mg/Kg	10	12-Oct-2018 20:20
4-Nitrophenol	< 0.11		0.11	0.78	mg/Kg	10	12-Oct-2018 20:20
Acenaphthene	0.077	J	0.030	0.20	mg/Kg	10	12-Oct-2018 20:20
Acenaphthylene	0.10	J	0.059	0.20	mg/Kg	10	12-Oct-2018 20:20
Anthracene	0.36		0.030	0.20	mg/Kg	10	12-Oct-2018 20:20
Benz(a)anthracene	1.4		0.095	0.20	mg/Kg	10	12-Oct-2018 20:20
Benzidine	< 0.083		0.083	0.39	mg/Kg	10	12-Oct-2018 20:20
Benzo(a)pyrene	1.6		0.059	0.20	mg/Kg	10	12-Oct-2018 20:20
Benzo(b)fluoranthene	1.8		0.071	0.20	mg/Kg	10	12-Oct-2018 20:20
Benzo(g,h,i)perylene	1.2		0.042	0.20	mg/Kg	10	12-Oct-2018 20:20
Benzo(k)fluoranthene	0.91		0.053	0.20	mg/Kg	10	12-Oct-2018 20:20
Benzyl alcohol	< 0.042		0.042	0.39	mg/Kg	10	12-Oct-2018 20:20
Bis(2-chloro-1-methylethyl) ether	< 0.083		0.083	0.39	mg/Kg	10	12-Oct-2018 20:20
Bis(2-chloroethoxy)methane	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 20:20
Bis(2-chloroethyl)ether	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 20:20
Bis(2-ethylhexyl)phthalate	< 0.10		0.10	0.39	mg/Kg	10	12-Oct-2018 20:20
Butyl benzyl phthalate	< 0.077		0.077	0.39	mg/Kg	10	12-Oct-2018 20:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB100-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-02
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270		Prep:SW3541 / 08-Oct-2018		Analyst: ACN	
Carbazole	0.13	J	0.071	0.39	mg/Kg	10	12-Oct-2018 20:20
Chrysene	1.7		0.047	0.20	mg/Kg	10	12-Oct-2018 20:20
Dibenz(a,h)anthracene	0.26		0.095	0.20	mg/Kg	10	12-Oct-2018 20:20
Dibenzofuran	0.071	J	0.042	0.20	mg/Kg	10	12-Oct-2018 20:20
Diethyl phthalate	< 0.059		0.059	0.39	mg/Kg	10	12-Oct-2018 20:20
Dimethyl phthalate	< 0.047		0.047	0.39	mg/Kg	10	12-Oct-2018 20:20
Di-n-butyl phthalate	< 0.071		0.071	0.39	mg/Kg	10	12-Oct-2018 20:20
Di-n-octyl phthalate	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 20:20
Fluoranthene	3.7		0.065	0.20	mg/Kg	10	12-Oct-2018 20:20
Fluorene	0.11	J	0.065	0.20	mg/Kg	10	12-Oct-2018 20:20
Hexachlorobenzene	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 20:20
Hexachlorobutadiene	< 0.071		0.071	0.39	mg/Kg	10	12-Oct-2018 20:20
Hexachlorocyclopentadiene	< 0.047		0.047	0.39	mg/Kg	10	12-Oct-2018 20:20
Hexachloroethane	< 0.089		0.089	0.39	mg/Kg	10	12-Oct-2018 20:20
Indeno(1,2,3-cd)pyrene	1.3		0.047	0.20	mg/Kg	10	12-Oct-2018 20:20
Isophorone	< 0.047		0.047	0.39	mg/Kg	10	12-Oct-2018 20:20
Naphthalene	< 0.036		0.036	0.20	mg/Kg	10	12-Oct-2018 20:20
Nitrobenzene	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 20:20
N-Nitrosodimethylamine	< 0.071		0.071	0.39	mg/Kg	10	12-Oct-2018 20:20
N-Nitrosodi-n-propylamine	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 20:20
N-Nitrosodiphenylamine	< 0.042		0.042	0.39	mg/Kg	10	12-Oct-2018 20:20
Pentachlorophenol	< 0.20		0.20	0.39	mg/Kg	10	12-Oct-2018 20:20
Phenanthrene	2.1		0.089	0.20	mg/Kg	10	12-Oct-2018 20:20
Phenol	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 20:20
Pyrene	3.2		0.036	0.20	mg/Kg	10	12-Oct-2018 20:20
Surr: 2,4,6-Tribromophenol	44.6			36-126	%REC	10	12-Oct-2018 20:20
Surr: 2-Fluorobiphenyl	65.0			43-125	%REC	10	12-Oct-2018 20:20
Surr: 2-Fluorophenol	60.9			37-125	%REC	10	12-Oct-2018 20:20
Surr: 4-Terphenyl-d14	67.4			32-125	%REC	10	12-Oct-2018 20:20
Surr: Nitrobenzene-d5	67.1			37-125	%REC	10	12-Oct-2018 20:20
Surr: Phenol-d6	52.0			40-125	%REC	10	12-Oct-2018 20:20
TEXAS TPH BY TX1005		Method:TX1005		Prep:TX1005PR / 08-Oct-2018		Analyst: MBG	
nC6 to nC12	1,100	J	710	4800	mg/Kg	100	09-Oct-2018 02:40
>nC12 to nC28	31,000		930	4800	mg/Kg	100	09-Oct-2018 02:40
>nC28 to nC35	3,300	J	930	4800	mg/Kg	100	09-Oct-2018 02:40
Total Petroleum Hydrocarbon	35,400		710	4800	mg/Kg	100	09-Oct-2018 02:40
Surr: 2-Fluorobiphenyl	0	S		70-130	%REC	100	09-Oct-2018 02:40
Surr: Trifluoromethyl benzene	0	S		70-130	%REC	100	09-Oct-2018 02:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB100-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-02
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
PETROLEUM HYDROCARBONS BY TX1006		Method:TX1006			Prep:TX1006PR / 11-Oct-2018		Analyst: MBG
Aliphatics nC6	< 4.8	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics >nC6 to nC8	< 4.8	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics >nC8 to nC10	< 4.8	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics >nC10 to nC12	< 4.8	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics >nC12 to nC16	< 4.8	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics >nC16 to nC21	47	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics >nC21 to nC35	50	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Total Aliphatic Fraction	97.0	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
Aliphatics Relative % Distribution	36	n	0	0	%	1	12-Oct-2018 04:57
Aromatics >nC7 to nC8	< 480	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Aromatics >nC8 to nC10	< 480	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Aromatics >nC10 to nC12	< 480	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Aromatics >nC12 to nC16	1,800	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Aromatics >nC16 to nC21	8,300	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Aromatics >nC21 to nC35	7,800	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Total Aromatic Fraction	17,900	n	480	950	mg/Kg	100	11-Oct-2018 23:09
Aromatics Relative % Distribution	64	n	0	0	%	100	11-Oct-2018 23:09
Total Petroleum Hydrocarbons	17,997	n	4.8	9.5	mg/Kg	1	12-Oct-2018 04:57
BURN RATE BY METHOD SW1030		Method:SW1030					Analyst: KAH
Ignitability, Solid	Negative		0	0	Burn Rate, mm/sec	1	15-Oct-2018 14:00
REACTIVE CYANIDE		Method:SW7.3.3.2			Prep:SW7.3.3.2		Analyst: MZD
Reactive Cyanide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 13:30
REACTIVE SULFIDE		Method:SW7.3.4.2					Analyst: MZD
Reactive Sulfide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 11:30
PH SOIL BY SW9045D		Method:SW9045B					Analyst: MZD
pH	8.67	H	0.100	0.100	pH Units	1	10-Oct-2018 13:15
Temp Deg C @pH	21.2	H	0	0	°C	1	10-Oct-2018 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB54-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-03
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
1,1,1-Trichloroethane	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
1,1,2,2-Tetrachloroethane	< 0.0066		0.0066	0.041	mg/Kg	10	16-Oct-2018 00:18
1,1,2-Trichloroethane	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
1,1-Dichloroethane	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
1,1-Dichloroethene	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
1,2-Dichlorobenzene	< 0.0082		0.0082	0.041	mg/Kg	10	16-Oct-2018 00:18
1,2-Dichloroethane	< 0.0049		0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
1,2-Dichloropropane	< 0.0066		0.0066	0.041	mg/Kg	10	16-Oct-2018 00:18
1,3-Dichlorobenzene	< 0.0082		0.0082	0.041	mg/Kg	10	16-Oct-2018 00:18
1,4-Dichlorobenzene	< 0.0082		0.0082	0.041	mg/Kg	10	16-Oct-2018 00:18
2-Butanone	< 0.011		0.011	0.082	mg/Kg	10	16-Oct-2018 00:18
2-Hexanone	< 0.011		0.011	0.082	mg/Kg	10	16-Oct-2018 00:18
4-Methyl-2-pentanone	< 0.016		0.016	0.082	mg/Kg	10	16-Oct-2018 00:18
Acetone	< 0.016		0.016	0.16	mg/Kg	10	16-Oct-2018 00:18
Benzene	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
Bromochloromethane	< 0.0074		0.0074	0.041	mg/Kg	10	16-Oct-2018 00:18
Bromodichloromethane	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
Bromoform	< 0.0049		0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
Bromomethane	< 0.0082		0.0082	0.082	mg/Kg	10	16-Oct-2018 00:18
Carbon disulfide	< 0.0049		0.0049	0.082	mg/Kg	10	16-Oct-2018 00:18
Carbon tetrachloride	< 0.0049		0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
Chlorobenzene	< 0.0049		0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
Chloroethane	< 0.0066		0.0066	0.082	mg/Kg	10	16-Oct-2018 00:18
Chloroform	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
Chloromethane	< 0.0041		0.0041	0.082	mg/Kg	10	16-Oct-2018 00:18
cis-1,2-Dichloroethene	< 0.0066		0.0066	0.041	mg/Kg	10	16-Oct-2018 00:18
cis-1,3-Dichloropropene	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
Dibromochloromethane	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
Ethylbenzene	0.033	J	0.0057	0.041	mg/Kg	10	16-Oct-2018 00:18
m,p-Xylene	0.048	J	0.013	0.082	mg/Kg	10	16-Oct-2018 00:18
Methylene chloride	< 0.0082		0.0082	0.082	mg/Kg	10	16-Oct-2018 00:18
o-Xylene	0.046		0.0082	0.041	mg/Kg	10	16-Oct-2018 00:18
Styrene	< 0.0057		0.0057	0.041	mg/Kg	10	16-Oct-2018 00:18
Tetrachloroethene	< 0.0057		0.0057	0.041	mg/Kg	10	16-Oct-2018 00:18
Toluene	0.030	J	0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
trans-1,2-Dichloroethene	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
trans-1,3-Dichloropropene	< 0.0049		0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
Trichloroethene	< 0.0049		0.0049	0.041	mg/Kg	10	16-Oct-2018 00:18
Vinyl acetate	< 0.0082		0.0082	0.082	mg/Kg	10	16-Oct-2018 00:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB54-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-03
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
Vinyl chloride	< 0.0066		0.0066	0.016	mg/Kg	10	16-Oct-2018 00:18
Xylenes, Total	0.094		0.0082	0.041	mg/Kg	10	16-Oct-2018 00:18
1,2-Dichloroethene, Total	< 0.0041		0.0041	0.041	mg/Kg	10	16-Oct-2018 00:18
Surr: 1,2-Dichloroethane-d4	82.6			70-126	%REC	10	16-Oct-2018 00:18
Surr: 4-Bromofluorobenzene	95.0			70-130	%REC	10	16-Oct-2018 00:18
Surr: Dibromofluoromethane	74.1			70-130	%REC	10	16-Oct-2018 00:18
Surr: Toluene-d8	101			70-130	%REC	10	16-Oct-2018 00:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB54-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-03
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270			Prep:SW3541 / 08-Oct-2018		Analyst: ACN
1,2,4-Trichlorobenzene	< 0.070		0.070	0.39	mg/Kg	10	12-Oct-2018 15:06
2,4,5-Trichlorophenol	< 0.15		0.15	0.39	mg/Kg	10	12-Oct-2018 15:06
2,4,6-Trichlorophenol	< 0.10		0.10	0.39	mg/Kg	10	12-Oct-2018 15:06
2,4-Dichlorophenol	< 0.076		0.076	0.39	mg/Kg	10	12-Oct-2018 15:06
2,4-Dimethylphenol	< 0.19		0.19	0.39	mg/Kg	10	12-Oct-2018 15:06
2,4-Dinitrophenol	< 0.26		0.26	0.77	mg/Kg	10	12-Oct-2018 15:06
2,4-Dinitrotoluene	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 15:06
2,6-Dinitrotoluene	< 0.19		0.19	0.39	mg/Kg	10	12-Oct-2018 15:06
2-Chloronaphthalene	< 0.076		0.076	0.39	mg/Kg	10	12-Oct-2018 15:06
2-Chlorophenol	< 0.076		0.076	0.39	mg/Kg	10	12-Oct-2018 15:06
2-Methylnaphthalene	< 0.029		0.029	0.19	mg/Kg	10	12-Oct-2018 15:06
2-Methylphenol	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 15:06
2-Nitroaniline	< 0.11		0.11	0.39	mg/Kg	10	12-Oct-2018 15:06
2-Nitrophenol	< 0.15		0.15	0.39	mg/Kg	10	12-Oct-2018 15:06
3&4-Methylphenol	< 0.059		0.059	0.39	mg/Kg	10	12-Oct-2018 15:06
3,3'-Dichlorobenzidine	< 0.15		0.15	0.39	mg/Kg	10	12-Oct-2018 15:06
3-Nitroaniline	< 0.11		0.11	0.39	mg/Kg	10	12-Oct-2018 15:06
4,6-Dinitro-2-methylphenol	< 0.12		0.12	0.39	mg/Kg	10	12-Oct-2018 15:06
4-Bromophenyl phenyl ether	< 0.094		0.094	0.39	mg/Kg	10	12-Oct-2018 15:06
4-Chloro-3-methylphenol	< 0.041		0.041	0.39	mg/Kg	10	12-Oct-2018 15:06
4-Chloroaniline	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 15:06
4-Chlorophenyl phenyl ether	< 0.088		0.088	0.39	mg/Kg	10	12-Oct-2018 15:06
4-Nitroaniline	< 0.13		0.13	0.39	mg/Kg	10	12-Oct-2018 15:06
4-Nitrophenol	< 0.11		0.11	0.77	mg/Kg	10	12-Oct-2018 15:06
Acenaphthene	0.16	J	0.029	0.19	mg/Kg	10	12-Oct-2018 15:06
Acenaphthylene	0.12	J	0.059	0.19	mg/Kg	10	12-Oct-2018 15:06
Anthracene	0.55		0.029	0.19	mg/Kg	10	12-Oct-2018 15:06
Benz(a)anthracene	2.1		0.094	0.19	mg/Kg	10	12-Oct-2018 15:06
Benzidine	< 0.082		0.082	0.39	mg/Kg	10	12-Oct-2018 15:06
Benzo(a)pyrene	2.2		0.059	0.19	mg/Kg	10	12-Oct-2018 15:06
Benzo(b)fluoranthene	2.8		0.070	0.19	mg/Kg	10	12-Oct-2018 15:06
Benzo(g,h,i)perylene	2.0		0.041	0.19	mg/Kg	10	12-Oct-2018 15:06
Benzo(k)fluoranthene	1.6		0.053	0.19	mg/Kg	10	12-Oct-2018 15:06
Benzyl alcohol	< 0.041		0.041	0.39	mg/Kg	10	12-Oct-2018 15:06
Bis(2-chloro-1-methylethyl) ether	< 0.082		0.082	0.39	mg/Kg	10	12-Oct-2018 15:06
Bis(2-chloroethoxy)methane	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 15:06
Bis(2-chloroethyl)ether	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 15:06
Bis(2-ethylhexyl)phthalate	< 0.10		0.10	0.39	mg/Kg	10	12-Oct-2018 15:06
Butyl benzyl phthalate	< 0.076		0.076	0.39	mg/Kg	10	12-Oct-2018 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB54-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-03
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270		Prep:SW3541 / 08-Oct-2018		Analyst: ACN	
Carbazole	0.22	J	0.070	0.39	mg/Kg	10	12-Oct-2018 15:06
Chrysene	2.5		0.047	0.19	mg/Kg	10	12-Oct-2018 15:06
Dibenz(a,h)anthracene	0.47		0.094	0.19	mg/Kg	10	12-Oct-2018 15:06
Dibenzofuran	0.089	J	0.041	0.19	mg/Kg	10	12-Oct-2018 15:06
Diethyl phthalate	< 0.059		0.059	0.39	mg/Kg	10	12-Oct-2018 15:06
Dimethyl phthalate	< 0.047		0.047	0.39	mg/Kg	10	12-Oct-2018 15:06
Di-n-butyl phthalate	0.16	J	0.070	0.39	mg/Kg	10	12-Oct-2018 15:06
Di-n-octyl phthalate	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 15:06
Fluoranthene	5.4		0.065	0.19	mg/Kg	10	12-Oct-2018 15:06
Fluorene	0.15	J	0.065	0.19	mg/Kg	10	12-Oct-2018 15:06
Hexachlorobenzene	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 15:06
Hexachlorobutadiene	< 0.070		0.070	0.39	mg/Kg	10	12-Oct-2018 15:06
Hexachlorocyclopentadiene	< 0.047		0.047	0.39	mg/Kg	10	12-Oct-2018 15:06
Hexachloroethane	< 0.088		0.088	0.39	mg/Kg	10	12-Oct-2018 15:06
Indeno(1,2,3-cd)pyrene	1.8		0.047	0.19	mg/Kg	10	12-Oct-2018 15:06
Isophorone	< 0.047		0.047	0.39	mg/Kg	10	12-Oct-2018 15:06
Naphthalene	< 0.035		0.035	0.19	mg/Kg	10	12-Oct-2018 15:06
Nitrobenzene	< 0.053		0.053	0.39	mg/Kg	10	12-Oct-2018 15:06
N-Nitrosodimethylamine	< 0.070		0.070	0.39	mg/Kg	10	12-Oct-2018 15:06
N-Nitrosodi-n-propylamine	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 15:06
N-Nitrosodiphenylamine	< 0.041		0.041	0.39	mg/Kg	10	12-Oct-2018 15:06
Pentachlorophenol	< 0.19		0.19	0.39	mg/Kg	10	12-Oct-2018 15:06
Phenanthrene	2.9		0.088	0.19	mg/Kg	10	12-Oct-2018 15:06
Phenol	< 0.065		0.065	0.39	mg/Kg	10	12-Oct-2018 15:06
Pyrene	4.8		0.035	0.19	mg/Kg	10	12-Oct-2018 15:06
Surr: 2,4,6-Tribromophenol	88.8			36-126	%REC	10	12-Oct-2018 15:06
Surr: 2-Fluorobiphenyl	94.8			43-125	%REC	10	12-Oct-2018 15:06
Surr: 2-Fluorophenol	68.0			37-125	%REC	10	12-Oct-2018 15:06
Surr: 4-Terphenyl-d14	106			32-125	%REC	10	12-Oct-2018 15:06
Surr: Nitrobenzene-d5	90.6			37-125	%REC	10	12-Oct-2018 15:06
Surr: Phenol-d6	85.5			40-125	%REC	10	12-Oct-2018 15:06
TEXAS TPH BY TX1005		Method:TX1005		Prep:TX1005PR / 08-Oct-2018		Analyst: MBG	
nC6 to nC12	1,600	J	690	4700	mg/Kg	100	09-Oct-2018 03:09
>nC12 to nC28	29,000		920	4700	mg/Kg	100	09-Oct-2018 03:09
>nC28 to nC35	2,300	J	920	4700	mg/Kg	100	09-Oct-2018 03:09
Total Petroleum Hydrocarbon	32,900		690	4700	mg/Kg	100	09-Oct-2018 03:09
Surr: 2-Fluorobiphenyl	0	S		70-130	%REC	100	09-Oct-2018 03:09
Surr: Trifluoromethyl benzene	0	S		70-130	%REC	100	09-Oct-2018 03:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB54-20181005
 Collection Date: 05-Oct-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-03
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
PETROLEUM HYDROCARBONS BY TX1006		Method:TX1006			Prep:TX1006PR / 11-Oct-2018		Analyst: MBG
Aliphatics nC6	< 4.7	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics >nC6 to nC8	< 4.7	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics >nC8 to nC10	< 4.7	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics >nC10 to nC12	< 4.7	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics >nC12 to nC16	24	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics >nC16 to nC21	55	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics >nC21 to nC35	32	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Total Aliphatic Fraction	111	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
Aliphatics Relative % Distribution	49	n	0	0	%	1	12-Oct-2018 05:26
Aromatics >nC7 to nC8	< 470	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Aromatics >nC8 to nC10	< 470	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Aromatics >nC10 to nC12	< 470	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Aromatics >nC12 to nC16	1,400	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Aromatics >nC16 to nC21	4,800	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Aromatics >nC21 to nC35	5,200	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Total Aromatic Fraction	11,400	n	470	940	mg/Kg	100	11-Oct-2018 23:38
Aromatics Relative % Distribution	51	n	0	0	%	100	11-Oct-2018 23:38
Total Petroleum Hydrocarbons	11,511	n	4.7	9.4	mg/Kg	1	12-Oct-2018 05:26
BURN RATE BY METHOD SW1030		Method:SW1030					Analyst: KAH
Ignitability, Solid	Negative		0	0	Burn Rate, mm/sec	1	15-Oct-2018 14:00
REACTIVE CYANIDE		Method:SW7.3.3.2			Prep:SW7.3.3.2		Analyst: MZD
Reactive Cyanide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 13:30
REACTIVE SULFIDE		Method:SW7.3.4.2					Analyst: MZD
Reactive Sulfide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 11:30
PH SOIL BY SW9045D		Method:SW9045B					Analyst: MZD
pH	11.3	H	0.100	0.100	pH Units	1	10-Oct-2018 13:15
Temp Deg C @pH	20.9	H	0	0	°C	1	10-Oct-2018 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB13-20181005
 Collection Date: 05-Oct-2018 08:45

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-04
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
1,1,1-Trichloroethane	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
1,1,2,2-Tetrachloroethane	< 0.0072		0.0072	0.045	mg/Kg	10	16-Oct-2018 00:43
1,1,2-Trichloroethane	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
1,1-Dichloroethane	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
1,1-Dichloroethene	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
1,2-Dichlorobenzene	< 0.0090		0.0090	0.045	mg/Kg	10	16-Oct-2018 00:43
1,2-Dichloroethane	< 0.0054		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
1,2-Dichloropropane	< 0.0072		0.0072	0.045	mg/Kg	10	16-Oct-2018 00:43
1,3-Dichlorobenzene	< 0.0090		0.0090	0.045	mg/Kg	10	16-Oct-2018 00:43
1,4-Dichlorobenzene	< 0.0090		0.0090	0.045	mg/Kg	10	16-Oct-2018 00:43
2-Butanone	< 0.012		0.012	0.090	mg/Kg	10	16-Oct-2018 00:43
2-Hexanone	< 0.013		0.013	0.090	mg/Kg	10	16-Oct-2018 00:43
4-Methyl-2-pentanone	< 0.018		0.018	0.090	mg/Kg	10	16-Oct-2018 00:43
Acetone	< 0.018		0.018	0.18	mg/Kg	10	16-Oct-2018 00:43
Benzene	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
Bromochloromethane	< 0.0081		0.0081	0.045	mg/Kg	10	16-Oct-2018 00:43
Bromodichloromethane	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
Bromoform	< 0.0054		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
Bromomethane	< 0.0090		0.0090	0.090	mg/Kg	10	16-Oct-2018 00:43
Carbon disulfide	< 0.0054		0.0054	0.090	mg/Kg	10	16-Oct-2018 00:43
Carbon tetrachloride	< 0.0054		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
Chlorobenzene	< 0.0054		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
Chloroethane	< 0.0072		0.0072	0.090	mg/Kg	10	16-Oct-2018 00:43
Chloroform	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
Chloromethane	< 0.0045		0.0045	0.090	mg/Kg	10	16-Oct-2018 00:43
cis-1,2-Dichloroethene	< 0.0072		0.0072	0.045	mg/Kg	10	16-Oct-2018 00:43
cis-1,3-Dichloropropene	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
Dibromochloromethane	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
Ethylbenzene	0.039	J	0.0063	0.045	mg/Kg	10	16-Oct-2018 00:43
m,p-Xylene	0.035	J	0.014	0.090	mg/Kg	10	16-Oct-2018 00:43
Methylene chloride	< 0.0090		0.0090	0.090	mg/Kg	10	16-Oct-2018 00:43
o-Xylene	0.064		0.0090	0.045	mg/Kg	10	16-Oct-2018 00:43
Styrene	< 0.0063		0.0063	0.045	mg/Kg	10	16-Oct-2018 00:43
Tetrachloroethene	< 0.0063		0.0063	0.045	mg/Kg	10	16-Oct-2018 00:43
Toluene	0.085		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
trans-1,2-Dichloroethene	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
trans-1,3-Dichloropropene	< 0.0054		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
Trichloroethene	< 0.0054		0.0054	0.045	mg/Kg	10	16-Oct-2018 00:43
Vinyl acetate	< 0.0090		0.0090	0.090	mg/Kg	10	16-Oct-2018 00:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB13-20181005
 Collection Date: 05-Oct-2018 08:45

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-04
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		Method:SW8260			Analyst: WLR		
Vinyl chloride	< 0.0072		0.0072	0.018	mg/Kg	10	16-Oct-2018 00:43
Xylenes, Total	0.099		0.0090	0.045	mg/Kg	10	16-Oct-2018 00:43
1,2-Dichloroethene, Total	< 0.0045		0.0045	0.045	mg/Kg	10	16-Oct-2018 00:43
Surr: 1,2-Dichloroethane-d4	81.7			70-126	%REC	10	16-Oct-2018 00:43
Surr: 4-Bromofluorobenzene	92.9			70-130	%REC	10	16-Oct-2018 00:43
Surr: Dibromofluoromethane	89.3			70-130	%REC	10	16-Oct-2018 00:43
Surr: Toluene-d8	102			70-130	%REC	10	16-Oct-2018 00:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB13-20181005
 Collection Date: 05-Oct-2018 08:45

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-04
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270			Prep:SW3541 / 08-Oct-2018		Analyst: ACN
1,2,4-Trichlorobenzene	< 0.0071		0.0071	0.039	mg/Kg	1	12-Oct-2018 14:47
2,4,5-Trichlorophenol	< 0.015		0.015	0.039	mg/Kg	1	12-Oct-2018 14:47
2,4,6-Trichlorophenol	< 0.010		0.010	0.039	mg/Kg	1	12-Oct-2018 14:47
2,4-Dichlorophenol	< 0.0077		0.0077	0.039	mg/Kg	1	12-Oct-2018 14:47
2,4-Dimethylphenol	< 0.020		0.020	0.039	mg/Kg	1	12-Oct-2018 14:47
2,4-Dinitrophenol	< 0.027		0.027	0.078	mg/Kg	1	12-Oct-2018 14:47
2,4-Dinitrotoluene	< 0.0053		0.0053	0.039	mg/Kg	1	12-Oct-2018 14:47
2,6-Dinitrotoluene	< 0.020		0.020	0.039	mg/Kg	1	12-Oct-2018 14:47
2-Chloronaphthalene	< 0.0077		0.0077	0.039	mg/Kg	1	12-Oct-2018 14:47
2-Chlorophenol	< 0.0077		0.0077	0.039	mg/Kg	1	12-Oct-2018 14:47
2-Methylnaphthalene	0.022		0.0030	0.020	mg/Kg	1	12-Oct-2018 14:47
2-Methylphenol	< 0.0065		0.0065	0.039	mg/Kg	1	12-Oct-2018 14:47
2-Nitroaniline	< 0.011		0.011	0.039	mg/Kg	1	12-Oct-2018 14:47
2-Nitrophenol	< 0.015		0.015	0.039	mg/Kg	1	12-Oct-2018 14:47
3&4-Methylphenol	< 0.0059		0.0059	0.039	mg/Kg	1	12-Oct-2018 14:47
3,3'-Dichlorobenzidine	< 0.015		0.015	0.039	mg/Kg	1	12-Oct-2018 14:47
3-Nitroaniline	< 0.011		0.011	0.039	mg/Kg	1	12-Oct-2018 14:47
4,6-Dinitro-2-methylphenol	< 0.012		0.012	0.039	mg/Kg	1	12-Oct-2018 14:47
4-Bromophenyl phenyl ether	< 0.0095		0.0095	0.039	mg/Kg	1	12-Oct-2018 14:47
4-Chloro-3-methylphenol	< 0.0042		0.0042	0.039	mg/Kg	1	12-Oct-2018 14:47
4-Chloroaniline	< 0.0065		0.0065	0.039	mg/Kg	1	12-Oct-2018 14:47
4-Chlorophenyl phenyl ether	< 0.0089		0.0089	0.039	mg/Kg	1	12-Oct-2018 14:47
4-Nitroaniline	< 0.013		0.013	0.039	mg/Kg	1	12-Oct-2018 14:47
4-Nitrophenol	< 0.011		0.011	0.078	mg/Kg	1	12-Oct-2018 14:47
Acenaphthene	0.13		0.0030	0.020	mg/Kg	1	12-Oct-2018 14:47
Acenaphthylene	0.074		0.0059	0.020	mg/Kg	1	12-Oct-2018 14:47
Anthracene	0.53		0.0030	0.020	mg/Kg	1	12-Oct-2018 14:47
Benz(a)anthracene	1.7		0.095	0.20	mg/Kg	10	15-Oct-2018 14:41
Benzidine	< 0.0083		0.0083	0.039	mg/Kg	1	12-Oct-2018 14:47
Benzo(a)pyrene	1.8		0.059	0.20	mg/Kg	10	15-Oct-2018 14:41
Benzo(b)fluoranthene	2.2		0.071	0.20	mg/Kg	10	15-Oct-2018 14:41
Benzo(g,h,i)perylene	1.7		0.0042	0.020	mg/Kg	1	12-Oct-2018 14:47
Benzo(k)fluoranthene	1.5		0.0053	0.020	mg/Kg	1	12-Oct-2018 14:47
Benzyl alcohol	< 0.0042		0.0042	0.039	mg/Kg	1	12-Oct-2018 14:47
Bis(2-chloro-1-methylethyl) ether	< 0.0083		0.0083	0.039	mg/Kg	1	12-Oct-2018 14:47
Bis(2-chloroethoxy)methane	< 0.0053		0.0053	0.039	mg/Kg	1	12-Oct-2018 14:47
Bis(2-chloroethyl)ether	< 0.0065		0.0065	0.039	mg/Kg	1	12-Oct-2018 14:47
Bis(2-ethylhexyl)phthalate	< 0.010		0.010	0.039	mg/Kg	1	12-Oct-2018 14:47
Butyl benzyl phthalate	< 0.0077		0.0077	0.039	mg/Kg	1	12-Oct-2018 14:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB13-20181005
 Collection Date: 05-Oct-2018 08:45

ANALYTICAL REPORT
 WorkOrder:HS18100321
 Lab ID:HS18100321-04
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW-LEVEL SEMIVOLATILES BY 8270D		Method:SW8270			Prep:SW3541 / 08-Oct-2018		Analyst: ACN
Carbazole	0.21		0.0071	0.039	mg/Kg	1	12-Oct-2018 14:47
Chrysene	2.1		0.048	0.20	mg/Kg	10	15-Oct-2018 14:41
Dibenz(a,h)anthracene	0.39		0.0095	0.020	mg/Kg	1	12-Oct-2018 14:47
Dibenzofuran	0.087		0.0042	0.020	mg/Kg	1	12-Oct-2018 14:47
Diethyl phthalate	< 0.0059		0.0059	0.039	mg/Kg	1	12-Oct-2018 14:47
Dimethyl phthalate	< 0.0048		0.0048	0.039	mg/Kg	1	12-Oct-2018 14:47
Di-n-butyl phthalate	0.075		0.0071	0.039	mg/Kg	1	12-Oct-2018 14:47
Di-n-octyl phthalate	< 0.0053		0.0053	0.039	mg/Kg	1	12-Oct-2018 14:47
Fluoranthene	4.5		0.065	0.20	mg/Kg	10	15-Oct-2018 14:41
Fluorene	0.12		0.0065	0.020	mg/Kg	1	12-Oct-2018 14:47
Hexachlorobenzene	< 0.0053		0.0053	0.039	mg/Kg	1	12-Oct-2018 14:47
Hexachlorobutadiene	< 0.0071		0.0071	0.039	mg/Kg	1	12-Oct-2018 14:47
Hexachlorocyclopentadiene	< 0.0048		0.0048	0.039	mg/Kg	1	12-Oct-2018 14:47
Hexachloroethane	< 0.0089		0.0089	0.039	mg/Kg	1	12-Oct-2018 14:47
Indeno(1,2,3-cd)pyrene	1.7		0.0048	0.020	mg/Kg	1	12-Oct-2018 14:47
Isophorone	< 0.0048		0.0048	0.039	mg/Kg	1	12-Oct-2018 14:47
Naphthalene	0.040		0.0036	0.020	mg/Kg	1	12-Oct-2018 14:47
Nitrobenzene	< 0.0053		0.0053	0.039	mg/Kg	1	12-Oct-2018 14:47
N-Nitrosodimethylamine	< 0.0071		0.0071	0.039	mg/Kg	1	12-Oct-2018 14:47
N-Nitrosodi-n-propylamine	< 0.0065		0.0065	0.039	mg/Kg	1	12-Oct-2018 14:47
N-Nitrosodiphenylamine	< 0.0042		0.0042	0.039	mg/Kg	1	12-Oct-2018 14:47
Pentachlorophenol	< 0.020		0.020	0.039	mg/Kg	1	12-Oct-2018 14:47
Phenanthrene	2.6		0.089	0.20	mg/Kg	10	15-Oct-2018 14:41
Phenol	< 0.0065		0.0065	0.039	mg/Kg	1	12-Oct-2018 14:47
Pyrene	4.0		0.036	0.20	mg/Kg	10	15-Oct-2018 14:41
Surr: 2,4,6-Tribromophenol	71.0			36-126	%REC	10	15-Oct-2018 14:41
Surr: 2,4,6-Tribromophenol	95.0			36-126	%REC	1	12-Oct-2018 14:47
Surr: 2-Fluorobiphenyl	99.7			43-125	%REC	1	12-Oct-2018 14:47
Surr: 2-Fluorobiphenyl	75.2			43-125	%REC	10	15-Oct-2018 14:41
Surr: 2-Fluorophenol	67.5			37-125	%REC	10	15-Oct-2018 14:41
Surr: 2-Fluorophenol	82.5			37-125	%REC	1	12-Oct-2018 14:47
Surr: 4-Terphenyl-d14	104			32-125	%REC	1	12-Oct-2018 14:47
Surr: 4-Terphenyl-d14	91.1			32-125	%REC	10	15-Oct-2018 14:41
Surr: Nitrobenzene-d5	82.9			37-125	%REC	10	15-Oct-2018 14:41
Surr: Nitrobenzene-d5	103			37-125	%REC	1	12-Oct-2018 14:47
Surr: Phenol-d6	91.6			40-125	%REC	1	12-Oct-2018 14:47
Surr: Phenol-d6	73.0			40-125	%REC	10	15-Oct-2018 14:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.
 Project: Houston TX-Wood Preserving Works
 Sample ID: NAPL-1620-TPB13-20181005
 Collection Date: 05-Oct-2018 08:45

ANALYTICAL REPORT

WorkOrder:HS18100321
 Lab ID:HS18100321-04
 Matrix:Product

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TEXAS TPH BY TX1005		Method:TX1005		Prep:TX1005PR / 08-Oct-2018		Analyst: MBG	
nC6 to nC12	1,800	J	730	4900	mg/Kg	100	09-Oct-2018 03:39
>nC12 to nC28	19,000		960	4900	mg/Kg	100	09-Oct-2018 03:39
>nC28 to nC35	2,400	J	960	4900	mg/Kg	100	09-Oct-2018 03:39
Total Petroleum Hydrocarbon	23,200		730	4900	mg/Kg	100	09-Oct-2018 03:39
Surr: 2-Fluorobiphenyl	0	S		70-130	%REC	100	09-Oct-2018 03:39
Surr: Trifluoromethyl benzene	0	S		70-130	%REC	100	09-Oct-2018 03:39
PETROLEUM HYDROCARBONS BY TX1006		Method:TX1006		Prep:TX1006PR / 11-Oct-2018		Analyst: MBG	
Aliphatics nC6	< 4.9	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics >nC6 to nC8	< 4.9	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics >nC8 to nC10	< 4.9	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics >nC10 to nC12	< 4.9	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics >nC12 to nC16	< 4.9	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics >nC16 to nC21	12	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics >nC21 to nC35	9.5	Jn	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Total Aliphatic Fraction	21.5	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
Aliphatics Relative % Distribution	26	n	0	0	%	1	12-Oct-2018 05:55
Aromatics >nC7 to nC8	< 490	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Aromatics >nC8 to nC10	< 490	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Aromatics >nC10 to nC12	< 490	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Aromatics >nC12 to nC16	1,400	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Aromatics >nC16 to nC21	2,900	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Aromatics >nC21 to nC35	2,500	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Total Aromatic Fraction	6,800	n	490	980	mg/Kg	100	12-Oct-2018 00:07
Aromatics Relative % Distribution	74	n	0	0	%	100	12-Oct-2018 00:07
Total Petroleum Hydrocarbons	6,822	n	4.9	9.8	mg/Kg	1	12-Oct-2018 05:55
BURN RATE BY METHOD SW1030		Method:SW1030				Analyst: KAH	
Ignitability, Solid	Negative		0	0	Burn Rate, mm/sec	1	15-Oct-2018 14:00
REACTIVE CYANIDE		Method:SW7.3.3.2		Prep:SW7.3.3.2		Analyst: MZD	
Reactive Cyanide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 13:30
REACTIVE SULFIDE		Method:SW7.3.4.2				Analyst: MZD	
Reactive Sulfide	< 100	n	100	100	mg/Kg	1	12-Oct-2018 11:30
PH SOIL BY SW9045D		Method:SW9045B				Analyst: MZD	
pH	9.55	H	0.100	0.100	pH Units	1	10-Oct-2018 13:15
Temp Deg C @pH	21.0	H	0	0	°C	1	10-Oct-2018 13:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

Batch ID: 2684 **Method:** VOLATILES BY SW8260C

SampleID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS18100321-01	1	0.543 (g)	0.5 (mL)	0.92	Bulk (5030B)
HS18100321-02	1	0.567 (g)	0.5 (mL)	0.88	Bulk (5030B)
HS18100321-03	1	0.607 (g)	0.5 (mL)	0.82	Bulk (5030B)
HS18100321-04	1	0.558 (g)	0.5 (mL)	0.9	Bulk (5030B)

Batch ID: 133256 **Method:** TEXAS TPH BY TX1005 **Prep:** TX 1005_S PR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100321-01	1	10.14	10 (mL)	0.9862
HS18100321-02	1	10.5	10 (mL)	0.9524
HS18100321-03	1	10.68	10 (mL)	0.9363
HS18100321-04	1	10.18	10 (mL)	0.9823

Batch ID: 133297 **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D **Prep:** 3541_B_LOW

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100321-01	1	5.02	1 (mL)	0.1992
HS18100321-02	1	5.06	1 (mL)	0.1976
HS18100321-03	1	5.11	1 (mL)	0.1957
HS18100321-04	1	5.05	1 (mL)	0.198

Batch ID: 133411 **Method:** PETROLEUM HYDROCARBONS BY TX1006 **Prep:** TX 1006_S PR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18100321-01	1	10.14	10 (mL)	0.9862
HS18100321-02	1	10.5	10 (mL)	0.9524
HS18100321-03	1	10.68	10 (mL)	0.9363
HS18100321-04	1	10.18	10 (mL)	0.9823

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 133256 Test Name : TEXAS TPH BY TX1005 Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00		08 Oct 2018 13:00	08 Oct 2018 18:46	100
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00		08 Oct 2018 13:00	09 Oct 2018 02:40	100
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00		08 Oct 2018 13:00	09 Oct 2018 03:09	100
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45		08 Oct 2018 13:00	09 Oct 2018 03:39	100
Batch ID 133297 Test Name : LOW-LEVEL SEMIVOLATILES BY 8270D Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00		08 Oct 2018 17:00	12 Oct 2018 20:00	1
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00		08 Oct 2018 17:00	11 Oct 2018 20:06	10
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00		08 Oct 2018 17:00	12 Oct 2018 20:20	10
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00		08 Oct 2018 17:00	12 Oct 2018 15:06	10
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45		08 Oct 2018 17:00	15 Oct 2018 14:41	10
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45		08 Oct 2018 17:00	12 Oct 2018 14:47	1
Batch ID 133411 Test Name : PETROLEUM HYDROCARBONS BY TX1006 Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00		11 Oct 2018 11:44	12 Oct 2018 04:28	1
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00		11 Oct 2018 11:44	11 Oct 2018 22:40	100
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00		11 Oct 2018 11:44	12 Oct 2018 04:57	1
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00		11 Oct 2018 11:44	11 Oct 2018 23:09	100
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00		11 Oct 2018 11:44	12 Oct 2018 05:26	1
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00		11 Oct 2018 11:44	11 Oct 2018 23:38	100
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45		11 Oct 2018 11:44	12 Oct 2018 05:55	1
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45		11 Oct 2018 11:44	12 Oct 2018 00:07	100
Batch ID R325118 Test Name : PH SOIL BY SW9045D Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00			10 Oct 2018 13:15	1
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00			10 Oct 2018 13:15	1
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00			10 Oct 2018 13:15	1
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45			10 Oct 2018 13:15	1
Batch ID R325330 Test Name : REACTIVE SULFIDE Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00			12 Oct 2018 11:30	1
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00			12 Oct 2018 11:30	1
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00			12 Oct 2018 11:30	1
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45			12 Oct 2018 11:30	1

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R325337 Test Name : REACTIVE CYANIDE Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00			12 Oct 2018 13:30	1
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00			12 Oct 2018 13:30	1
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00			12 Oct 2018 13:30	1
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45			12 Oct 2018 13:30	1
Batch ID R325453 Test Name : BURN RATE BY METHOD SW1030 Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00			15 Oct 2018 14:00	1
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00			15 Oct 2018 14:00	1
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00			15 Oct 2018 14:00	1
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45			15 Oct 2018 14:00	1
Batch ID R325468 Test Name : VOLATILES BY SW8260C Matrix: Product						
HS18100321-01	NAPL-1620-TPB105-20181005	05 Oct 2018 07:00			15 Oct 2018 23:29	10
HS18100321-02	NAPL-1620-TPB100-20181005	05 Oct 2018 08:00			15 Oct 2018 23:54	10
HS18100321-03	NAPL-1620-TPB54-20181005	05 Oct 2018 08:00			16 Oct 2018 00:18	10
HS18100321-04	NAPL-1620-TPB13-20181005	05 Oct 2018 08:45			16 Oct 2018 00:43	10

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133256		Instrument: FID-10		Method: TX1005						
MBLK	Sample ID: MBLK-133256	Units: mg/Kg			Analysis Date: 08-Oct-2018 17:17					
Client ID:	Run ID: FID-10_324979	SeqNo: 4762936		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
nC6 to nC12	< 7.4	50								
>nC12 to nC28	< 9.8	50								
>nC28 to nC35	< 9.8	50								
Total Petroleum Hydrocarbon	< 7.4	50								
Surr: 2-Fluorobiphenyl	21.12	0	25	0	84.5	70 - 130				
Surr: Trifluoromethyl benzene	21.73	0	25	0	86.9	70 - 130				
LCS	Sample ID: LCS-133256	Units: mg/Kg			Analysis Date: 08-Oct-2018 17:46					
Client ID:	Run ID: FID-10_324979	SeqNo: 4762937		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
nC6 to nC12	289.2	50	250	0	116	75 - 125				
>nC12 to nC28	201.8	50	250	0	80.7	75 - 125				
Surr: 2-Fluorobiphenyl	20.06	0	25	0	80.2	70 - 130				
Surr: Trifluoromethyl benzene	20.68	0	25	0	82.7	70 - 130				
LCSD	Sample ID: LCSD-133256	Units: mg/Kg			Analysis Date: 08-Oct-2018 18:16					
Client ID:	Run ID: FID-10_324979	SeqNo: 4762938		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
nC6 to nC12	280.6	50	250	0	112	75 - 125	289.2	3.04	20	
>nC12 to nC28	211.5	50	250	0	84.6	75 - 125	201.8	4.69	20	
Surr: 2-Fluorobiphenyl	20.03	0	25	0	80.1	70 - 130	20.06	0.152	20	
Surr: Trifluoromethyl benzene	19.06	0	25	0	76.2	70 - 130	20.68	8.18	20	
MS	Sample ID: HS18100321-01MS	Units: mg/Kg			Analysis Date: 08-Oct-2018 19:15					
Client ID: NAPL-1620-TPB105-20181005	Run ID: FID-10_324979	SeqNo: 4762940		PrepDate: 08-Oct-2018		DF: 100				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
nC6 to nC12	2900	4800	241.5	4999	-869	75 - 125			JSO	
>nC12 to nC28	17620	4800	241.5	17410	85.4	75 - 125			O	
Surr: 2-Fluorobiphenyl	< 0	0	24.15	0	0	70 - 130			S	
Surr: Trifluoromethyl benzene	< 0	0	24.15	0	0	70 - 130			S	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133256		Instrument: FID-10		Method: TX1005						
MSD	Sample ID: HS18100321-01MSD			Units: mg/Kg		Analysis Date: 08-Oct-2018 19:45				
Client ID: NAPL-1620-TPB105-20181005	Run ID: FID-10_324979		SeqNo: 4762941		PrepDate: 08-Oct-2018		DF: 100			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

nC6 to nC12	2286	4800	242.2	4999	-1120	75 - 125	2900	0	20	JSO
>nC12 to nC28	17620	4800	242.2	17410	87.3	75 - 125	17620	0.0293	20	O
Surr: 2-Fluorobiphenyl	< 0	0	24.22	0	0	70 - 130	0	0	20	S
Surr: Trifluoromethyl benzene	< 0	0	24.22	0	0	70 - 130	0	0	20	S

The following samples were analyzed in this batch:

HS18100321-01	HS18100321-02	HS18100321-03	HS18100321-04
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Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133411 **Instrument:** FID-12 **Method:** TX1006

MBLK		Sample ID: MBLK-133411		Units: mg/Kg		Analysis Date: 12-Oct-2018 00:36				
Client ID:		Run ID: FID-12_325587		SeqNo: 4775855		PrepDate: 11-Oct-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics nC6	< 5.0	10								
Aliphatics >nC6 to nC8	< 5.0	10								
Aliphatics >nC8 to nC10	< 5.0	10								
Aliphatics >nC10 to nC12	< 5.0	10								
Aliphatics >nC12 to nC16	< 5.0	10								
Aliphatics >nC16 to nC21	< 5.0	10								
Aliphatics >nC21 to nC35	< 5.0	10								
Total Aliphatic Fraction	< 5.0	10								
Aliphatics Relative % Distribution			0							
Total Petroleum Hydrocarbons	< 5.0	10								

MBLK		Sample ID: MBLK-133411		Units: mg/Kg		Analysis Date: 11-Oct-2018 19:46				
Client ID:		Run ID: FID-12_325586		SeqNo: 4775845		PrepDate: 11-Oct-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >nC7 to nC8	< 5.0	10								
Aromatics >nC8 to nC10	< 5.0	10								
Aromatics >nC10 to nC12	< 5.0	10								
Aromatics >nC12 to nC16	< 5.0	10								
Aromatics >nC16 to nC21	< 5.0	10								
Aromatics >nC21 to nC35	< 5.0	10								
Total Aromatic Fraction	< 5.0	10								
Aromatics Relative % Distribution			0							

LCS		Sample ID: LCS-133411		Units: mg/Kg		Analysis Date: 12-Oct-2018 02:03				
Client ID:		Run ID: FID-12_325587		SeqNo: 4775856		PrepDate: 11-Oct-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Petroleum Hydrocarbons	427.1	10	500	0	85.4	60 - 140				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133411		Instrument: FID-12		Method: TX1006						
LCSD	Sample ID: LCSD-133411	Units: mg/Kg			Analysis Date: 12-Oct-2018 02:32					
Client ID:	Run ID: FID-12_325587	SeqNo: 4775857		PrepDate: 11-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	

Total Petroleum Hydrocarbons	433.4	10	500	0	86.7	60 - 140	427.1	1.46	30
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The following samples were analyzed in this batch:

HS18100321-01	HS18100321-02	HS18100321-03	HS18100321-04
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Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-133297	Units: ug/Kg			Analysis Date: 10-Oct-2018 11:29					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766071		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	< 1.2	6.6								
2,4,5-Trichlorophenol	< 2.5	6.6								
2,4,6-Trichlorophenol	< 1.7	6.6								
2,4-Dichlorophenol	< 1.3	6.6								
2,4-Dimethylphenol	< 3.3	6.6								
2,4-Dinitrophenol	< 4.5	13								
2,4-Dinitrotoluene	< 0.90	6.6								
2,6-Dinitrotoluene	< 3.3	6.6								
2-Chloronaphthalene	< 1.3	6.6								
2-Chlorophenol	< 1.3	6.6								
2-Methylnaphthalene	< 0.50	3.3								
2-Methylphenol	< 1.1	6.6								
2-Nitroaniline	< 1.9	6.6								
2-Nitrophenol	< 2.5	6.6								
3&4-Methylphenol	< 1.0	6.6								
3,3'-Dichlorobenzidine	< 2.5	6.6								
3-Nitroaniline	< 1.9	6.6								
4,6-Dinitro-2-methylphenol	< 2.1	6.6								
4-Bromophenyl phenyl ether	< 1.6	6.6								
4-Chloro-3-methylphenol	< 0.70	6.6								
4-Chloroaniline	< 1.1	6.6								
4-Chlorophenyl phenyl ether	< 1.5	6.6								
4-Nitroaniline	< 2.2	6.6								
4-Nitrophenol	< 1.9	13								
Acenaphthene	< 0.50	3.3								
Acenaphthylene	< 1.0	3.3								
Anthracene	< 0.50	3.3								
Benz(a)anthracene	< 1.6	3.3								
Benzidine	< 1.4	6.6								
Benzo(a)pyrene	< 1.0	3.3								
Benzo(b)fluoranthene	< 1.2	3.3								
Benzo(g,h,i)perylene	< 0.70	3.3								
Benzo(k)fluoranthene	< 0.90	3.3								
Benzyl alcohol	< 0.70	6.6								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-133297	Units: ug/Kg			Analysis Date: 10-Oct-2018 11:29					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766071	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	< 1.4	6.6								
Bis(2-chloroethoxy)methane	< 0.90	6.6								
Bis(2-chloroethyl)ether	< 1.1	6.6								
Bis(2-ethylhexyl)phthalate	< 1.7	6.6								
Butyl benzyl phthalate	< 1.3	6.6								
Carbazole	< 1.2	6.6								
Chrysene	< 0.80	3.3								
Dibenz(a,h)anthracene	< 1.6	3.3								
Dibenzofuran	< 0.70	3.3								
Diethyl phthalate	< 1.0	6.6								
Dimethyl phthalate	< 0.80	6.6								
Di-n-butyl phthalate	< 1.2	6.6								
Di-n-octyl phthalate	< 0.90	6.6								
Fluoranthene	< 1.1	3.3								
Fluorene	< 1.1	3.3								
Hexachlorobenzene	< 0.90	6.6								
Hexachlorobutadiene	< 1.2	6.6								
Hexachlorocyclopentadiene	< 0.80	6.6								
Hexachloroethane	< 1.5	6.6								
Indeno(1,2,3-cd)pyrene	< 0.80	3.3								
Isophorone	< 0.80	6.6								
Naphthalene	< 0.60	3.3								
Nitrobenzene	< 0.90	6.6								
N-Nitrosodimethylamine	< 1.2	6.6								
N-Nitrosodi-n-propylamine	< 1.1	6.6								
N-Nitrosodiphenylamine	< 0.70	6.6								
Pentachlorophenol	< 3.3	6.6								
Phenanthrene	< 1.5	3.3								
Phenol	< 1.1	6.6								
Pyrene	< 0.60	3.3								
Surr: 2,4,6-Tribromophenol	138.8	0	167	0	83.1	36 - 126				
Surr: 2-Fluorobiphenyl	139.3	0	167	0	83.4	43 - 125				
Surr: 2-Fluorophenol	123.4	0	167	0	73.9	37 - 125				
Surr: 4-Terphenyl-d14	156	0	167	0	93.4	32 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-133297	Units: ug/Kg			Analysis Date: 10-Oct-2018 11:29					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766071		PrepDate: 08-Oct-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Surr: Nitrobenzene-d5	136	0	167	0	81.5	37 - 125				
Surr: Phenol-d6	127	0	167	0	76.1	40 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
LCS	Sample ID: LCS-133297	Units: ug/Kg			Analysis Date: 10-Oct-2018 11:49					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766072	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	128	6.6	167	0	76.7	50 - 120				
2,4,5-Trichlorophenol	132.5	6.6	167	0	79.3	45 - 127				
2,4,6-Trichlorophenol	137.4	6.6	167	0	82.2	45 - 130				
2,4-Dichlorophenol	134.5	6.6	167	0	80.6	45 - 125				
2,4-Dimethylphenol	123.7	6.6	167	0	74.1	45 - 120				
2,4-Dinitrophenol	114.1	13	167	0	68.3	10 - 126				
2,4-Dinitrotoluene	147.2	6.6	167	0	88.1	50 - 130				
2,6-Dinitrotoluene	143.9	6.6	167	0	86.2	50 - 125				
2-Chloronaphthalene	135.1	6.6	167	0	80.9	50 - 145				
2-Chlorophenol	131.2	6.6	167	0	78.6	45 - 120				
2-Methylnaphthalene	131.1	3.3	167	0	78.5	50 - 120				
2-Methylphenol	132.6	6.6	167	0	79.4	45 - 120				
2-Nitroaniline	171.7	6.6	167	0	103	45 - 138				
2-Nitrophenol	138.1	6.6	167	0	82.7	45 - 125				
3&4-Methylphenol	134.5	6.6	167	0	80.5	45 - 120				
3,3'-Dichlorobenzidine	119.4	6.6	167	0	71.5	15 - 120				
3-Nitroaniline	152.9	6.6	167	0	91.6	40 - 120				
4,6-Dinitro-2-methylphenol	139.7	6.6	167	0	83.7	15 - 135				
4-Bromophenyl phenyl ether	135.8	6.6	167	0	81.3	50 - 125				
4-Chloro-3-methylphenol	131.3	6.6	167	0	78.6	45 - 130				
4-Chloroaniline	101.1	6.6	167	0	60.6	20 - 120				
4-Chlorophenyl phenyl ether	134.4	6.6	167	0	80.5	50 - 120				
4-Nitroaniline	148.8	6.6	167	0	89.1	50 - 127				
4-Nitrophenol	157	13	167	0	94.0	40 - 147				
Acenaphthene	131.5	3.3	167	0	78.8	50 - 120				
Acenaphthylene	136.3	3.3	167	0	81.6	50 - 120				
Anthracene	137.8	3.3	167	0	82.5	50 - 123				
Benz(a)anthracene	148.2	3.3	167	0	88.8	50 - 131				
Benzdine	19.61	6.6	167	0	11.7	10 - 120				
Benzo(a)pyrene	151.1	3.3	167	0	90.5	50 - 130				
Benzo(b)fluoranthene	153.8	3.3	167	0	92.1	50 - 137				
Benzo(g,h,i)perylene	139.5	3.3	167	0	83.6	50 - 130				
Benzo(k)fluoranthene	140.1	3.3	167	0	83.9	50 - 143				
Benzyl alcohol	131.6	6.6	167	0	78.8	40 - 143				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
LCS	Sample ID: LCS-133297	Units: ug/Kg			Analysis Date: 10-Oct-2018 11:49					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766072	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	121.1	6.6	167	0	72.5	50 - 120				
Bis(2-chloroethoxy)methane	120.5	6.6	167	0	72.2	50 - 120				
Bis(2-chloroethyl)ether	136.2	6.6	167	0	81.5	45 - 127				
Bis(2-ethylhexyl)phthalate	174.8	6.6	167	0	105	21 - 148				
Butyl benzyl phthalate	173.6	6.6	167	0	104	50 - 136				
Carbazole	145.3	6.6	167	0	87.0	50 - 143				
Chrysene	140.2	3.3	167	0	83.9	50 - 130				
Dibenz(a,h)anthracene	143.5	3.3	167	0	85.9	50 - 130				
Dibenzofuran	134	3.3	167	0	80.2	50 - 125				
Diethyl phthalate	140	6.6	167	0	83.8	50 - 125				
Dimethyl phthalate	134.6	6.6	167	0	80.6	50 - 125				
Di-n-butyl phthalate	152.7	6.6	167	0	91.4	50 - 140				
Di-n-octyl phthalate	183.2	6.6	167	0	110	50 - 140				
Fluoranthene	144.6	3.3	167	0	86.6	50 - 131				
Fluorene	133.3	3.3	167	0	79.8	50 - 125				
Hexachlorobenzene	126.7	6.6	167	0	75.9	50 - 124				
Hexachlorobutadiene	133.9	6.6	167	0	80.2	50 - 125				
Hexachlorocyclopentadiene	91.95	6.6	167	0	55.1	45 - 135				
Hexachloroethane	131	6.6	167	0	78.4	45 - 125				
Indeno(1,2,3-cd)pyrene	175.4	3.3	167	0	105	45 - 139				
Isophorone	125	6.6	167	0	74.8	45 - 130				
Naphthalene	127.2	3.3	167	0	76.2	50 - 125				
Nitrobenzene	126.9	6.6	167	0	76.0	50 - 125				
N-Nitrosodimethylamine	97.6	6.6	167	0	58.4	20 - 140				
N-Nitrosodi-n-propylamine	128.2	6.6	167	0	76.8	45 - 120				
N-Nitrosodiphenylamine	134.9	6.6	167	0	80.7	50 - 130				
Pentachlorophenol	110.5	6.6	167	0	66.2	23 - 136				
Phenanthrene	131.8	3.3	167	0	78.9	50 - 125				
Phenol	131.1	6.6	167	0	78.5	45 - 130				
Pyrene	143.4	3.3	167	0	85.9	45 - 130				
Surr: 2,4,6-Tribromophenol	145.3	0	167	0	87.0	36 - 126				
Surr: 2-Fluorobiphenyl	141.6	0	167	0	84.8	43 - 125				
Surr: 2-Fluorophenol	107.6	0	167	0	64.4	37 - 125				
Surr: 4-Terphenyl-d14	153	0	167	0	91.6	32 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297 **Instrument:** SV-6 **Method:** SW8270

LCS Sample ID: **LCS-133297** Units: **ug/Kg** Analysis Date: **10-Oct-2018 11:49**
Client ID: Run ID: **SV-6_325120** SeqNo: **4766072** PrepDate: **08-Oct-2018** DF: **1**
Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

Surr: Nitrobenzene-d5 130.6 0 167 0 78.2 37 - 125

Surr: Phenol-d6 129.6 0 167 0 77.6 40 - 125

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MS	Sample ID: HS18100338-02MS	Units: ug/Kg			Analysis Date: 10-Oct-2018 14:15					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766284	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	123.9	6.6	166.5	0	74.4	50 - 120				
2,4,5-Trichlorophenol	133.3	6.6	166.5	0	80.0	45 - 127				
2,4,6-Trichlorophenol	126.4	6.6	166.5	0	75.9	45 - 130				
2,4-Dichlorophenol	122.3	6.6	166.5	0	73.4	45 - 125				
2,4-Dimethylphenol	98.93	6.6	166.5	0	59.4	45 - 120				
2,4-Dinitrophenol	84.13	13	166.5	0	50.5	10 - 126				
2,4-Dinitrotoluene	138.6	6.6	166.5	0	83.2	50 - 130				
2,6-Dinitrotoluene	133	6.6	166.5	0	79.9	50 - 125				
2-Chloronaphthalene	119.7	6.6	166.5	0	71.9	50 - 145				
2-Chlorophenol	120.2	6.6	166.5	0	72.2	45 - 120				
2-Methylnaphthalene	126.3	3.3	166.5	0	75.9	50 - 120				
2-Methylphenol	117.8	6.6	166.5	0	70.7	45 - 120				
2-Nitroaniline	152.7	6.6	166.5	0	91.7	45 - 138				
2-Nitrophenol	127.9	6.6	166.5	0	76.8	45 - 125				
3&4-Methylphenol	115.4	6.6	166.5	0	69.3	45 - 120				
3,3'-Dichlorobenzidine	193	6.6	166.5	0	116	15 - 120				
3-Nitroaniline	143	6.6	166.5	0	85.9	40 - 120				
4,6-Dinitro-2-methylphenol	119.4	6.6	166.5	0	71.7	15 - 135				
4-Bromophenyl phenyl ether	131.2	6.6	166.5	0	78.8	50 - 125				
4-Chloro-3-methylphenol	125.7	6.6	166.5	0	75.5	45 - 130				
4-Chloroaniline	195.1	6.6	166.5	0	117	20 - 120				
4-Chlorophenyl phenyl ether	122.6	6.6	166.5	0	73.7	50 - 120				
4-Nitroaniline	168.7	6.6	166.5	0	101	50 - 127				
4-Nitrophenol	147.1	13	166.5	0	88.3	40 - 147				
Acenaphthene	119.4	3.3	166.5	0	71.7	50 - 120				
Acenaphthylene	123.2	3.3	166.5	0	74.0	50 - 120				
Anthracene	133.1	3.3	166.5	0	79.9	50 - 123				
Benz(a)anthracene	152.2	3.3	166.5	0	91.4	50 - 131				
Benzdine	17.8	6.6	166.5	0	10.7	10 - 120				
Benzo(a)pyrene	158.5	3.3	166.5	0	95.2	50 - 130				
Benzo(b)fluoranthene	163.5	3.3	166.5	0	98.2	50 - 137				
Benzo(g,h,i)perylene	145.7	3.3	166.5	0	87.5	50 - 130				
Benzo(k)fluoranthene	147.4	3.3	166.5	0	88.5	50 - 143				
Benzyl alcohol	121	6.6	166.5	0	72.7	40 - 143				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MS	Sample ID: HS18100338-02MS	Units: ug/Kg			Analysis Date: 10-Oct-2018 14:15					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766284	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	110.3	6.6	166.5	0	66.2	50 - 120				
Bis(2-chloroethoxy)methane	115.7	6.6	166.5	0	69.5	50 - 120				
Bis(2-chloroethyl)ether	119.1	6.6	166.5	0	71.6	45 - 127				
Bis(2-ethylhexyl)phthalate	190.1	6.6	166.5	5.597	111	21 - 148				
Butyl benzyl phthalate	184.4	6.6	166.5	0	111	50 - 136				
Carbazole	158.2	6.6	166.5	0	95.0	50 - 143				
Chrysene	149.3	3.3	166.5	0	89.7	50 - 130				
Dibenz(a,h)anthracene	141.7	3.3	166.5	0	85.1	50 - 130				
Dibenzofuran	122.8	3.3	166.5	0	73.8	50 - 125				
Diethyl phthalate	126.5	6.6	166.5	0	76.0	50 - 125				
Dimethyl phthalate	123.3	6.6	166.5	0	74.0	50 - 125				
Di-n-butyl phthalate	156.8	6.6	166.5	0.8558	93.6	50 - 140				
Di-n-octyl phthalate	194.8	6.6	166.5	0	117	50 - 140				
Fluoranthene	141.7	3.3	166.5	1.487	84.2	50 - 131				
Fluorene	125	3.3	166.5	0	75.1	50 - 125				
Hexachlorobenzene	135	6.6	166.5	0	81.1	50 - 124				
Hexachlorobutadiene	126.3	6.6	166.5	0	75.9	50 - 125				
Hexachlorocyclopentadiene	81.77	6.6	166.5	0	49.1	45 - 135				
Hexachloroethane	115.1	6.6	166.5	0	69.1	45 - 125				
Indeno(1,2,3-cd)pyrene	159.5	3.3	166.5	0	95.8	45 - 139				
Isophorone	118.3	6.6	166.5	0	71.1	45 - 130				
Naphthalene	121.6	3.3	166.5	0	73.1	50 - 125				
Nitrobenzene	121.6	6.6	166.5	0	73.0	50 - 125				
N-Nitrosodimethylamine	88.11	6.6	166.5	0	52.9	20 - 140				
N-Nitrosodi-n-propylamine	117.7	6.6	166.5	0	70.7	45 - 120				
N-Nitrosodiphenylamine	135.1	6.6	166.5	0	81.2	50 - 130				
Pentachlorophenol	121.6	6.6	166.5	0	73.0	23 - 136				
Phenanthrene	126.7	3.3	166.5	1.044	75.4	50 - 125				
Phenol	117.8	6.6	166.5	0	70.7	45 - 130				
Pyrene	149.1	3.3	166.5	2.521	88.0	45 - 130				
Surr: 2,4,6-Tribromophenol	139.7	0	166.5	0	83.9	36 - 126				
Surr: 2-Fluorobiphenyl	124.9	0	166.5	0	75.0	43 - 125				
Surr: 2-Fluorophenol	94.99	0	166.5	0	57.1	37 - 125				
Surr: 4-Terphenyl-d14	155.4	0	166.5	0	93.3	32 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297 **Instrument:** SV-6 **Method:** SW8270

MS Sample ID: **HS18100338-02MS** Units: **ug/Kg** Analysis Date: **10-Oct-2018 14:15**
Client ID: Run ID: **SV-6_325120** SeqNo: **4766284** PrepDate: **08-Oct-2018** DF: **1**
Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

<i>Surr: Nitrobenzene-d5</i>	123.3	0	166.5	0	74.0	37 - 125				
<i>Surr: Phenol-d6</i>	111.5	0	166.5	0	67.0	40 - 125				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MSD	Sample ID: HS18100338-02MSD	Units: ug/Kg			Analysis Date: 10-Oct-2018 14:35					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766285	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	121.2	6.6	166.7	0	72.7	50 - 120	123.9	2.16	30	
2,4,5-Trichlorophenol	124.5	6.6	166.7	0	74.7	45 - 127	133.3	6.79	30	
2,4,6-Trichlorophenol	130.4	6.6	166.7	0	78.2	45 - 130	126.4	3.07	30	
2,4-Dichlorophenol	124	6.6	166.7	0	74.4	45 - 125	122.3	1.39	30	
2,4-Dimethylphenol	94.43	6.6	166.7	0	56.7	45 - 120	98.93	4.66	30	
2,4-Dinitrophenol	76.71	13	166.7	0	46.0	10 - 126	84.13	9.23	30	
2,4-Dinitrotoluene	140.1	6.6	166.7	0	84.0	50 - 130	138.6	1.09	30	
2,6-Dinitrotoluene	142.2	6.6	166.7	0	85.3	50 - 125	133	6.68	30	
2-Chloronaphthalene	124.5	6.6	166.7	0	74.7	50 - 145	119.7	3.98	30	
2-Chlorophenol	124.3	6.6	166.7	0	74.6	45 - 120	120.2	3.35	30	
2-Methylnaphthalene	125.4	3.3	166.7	0	75.2	50 - 120	126.3	0.71	30	
2-Methylphenol	123.4	6.6	166.7	0	74.0	45 - 120	117.8	4.63	30	
2-Nitroaniline	162	6.6	166.7	0	97.2	45 - 138	152.7	5.92	30	
2-Nitrophenol	127.5	6.6	166.7	0	76.5	45 - 125	127.9	0.323	30	
3&4-Methylphenol	119.1	6.6	166.7	0	71.5	45 - 120	115.4	3.22	30	
3,3'-Dichlorobenzidine	182.5	6.6	166.7	0	110	15 - 120	193	5.57	30	
3-Nitroaniline	106.1	6.6	166.7	0	63.6	40 - 120	143	29.7	30	
4,6-Dinitro-2-methylphenol	129.8	6.6	166.7	0	77.9	15 - 135	119.4	8.36	30	
4-Bromophenyl phenyl ether	135.2	6.6	166.7	0	81.1	50 - 125	131.2	3.01	30	
4-Chloro-3-methylphenol	122.1	6.6	166.7	0	73.3	45 - 130	125.7	2.89	30	
4-Chloroaniline	198.1	6.6	166.7	0	119	20 - 120	195.1	1.53	30	
4-Chlorophenyl phenyl ether	128.7	6.6	166.7	0	77.2	50 - 120	122.6	4.79	30	
4-Nitroaniline	156.3	6.6	166.7	0	93.8	50 - 127	168.7	7.62	30	
4-Nitrophenol	146.2	13	166.7	0	87.7	40 - 147	147.1	0.562	30	
Acenaphthene	125.9	3.3	166.7	0	75.5	50 - 120	119.4	5.24	30	
Acenaphthylene	127.7	3.3	166.7	0	76.6	50 - 120	123.2	3.62	30	
Anthracene	137.1	3.3	166.7	0	82.2	50 - 123	133.1	2.93	30	
Benz(a)anthracene	150.7	3.3	166.7	0	90.4	50 - 131	152.2	0.968	30	
Benzidine	15.27	6.6	166.7	0	9.16	10 - 120	17.8	15.3	30	S
Benzo(a)pyrene	153.1	3.3	166.7	0	91.8	50 - 130	158.5	3.47	30	
Benzo(b)fluoranthene	156.9	3.3	166.7	0	94.2	50 - 137	163.5	4.07	30	
Benzo(g,h,i)perylene	148.2	3.3	166.7	0	88.9	50 - 130	145.7	1.69	30	
Benzo(k)fluoranthene	149.8	3.3	166.7	0	89.9	50 - 143	147.4	1.56	30	
Benzyl alcohol	128.1	6.6	166.7	0	76.8	40 - 143	121	5.65	30	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270						
MSD	Sample ID: HS18100338-02MSD	Units: ug/Kg			Analysis Date: 10-Oct-2018 14:35					
Client ID:	Run ID: SV-6_325120	SeqNo: 4766285	PrepDate: 08-Oct-2018	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bis(2-chloro-1-methylethyl) ether	118	6.6	166.7	0	70.8	50 - 120	110.3	6.75	30	
Bis(2-chloroethoxy)methane	117.4	6.6	166.7	0	70.5	50 - 120	115.7	1.48	30	
Bis(2-chloroethyl)ether	127.8	6.6	166.7	0	76.7	45 - 127	119.1	7.05	30	
Bis(2-ethylhexyl)phthalate	183.5	6.6	166.7	5.597	107	21 - 148	190.1	3.55	30	
Butyl benzyl phthalate	181.1	6.6	166.7	0	109	50 - 136	184.4	1.8	30	
Carbazole	149.2	6.6	166.7	0	89.5	50 - 143	158.2	5.89	30	
Chrysene	143	3.3	166.7	0	85.8	50 - 130	149.3	4.34	30	
Dibenz(a,h)anthracene	154.2	3.3	166.7	0	92.5	50 - 130	141.7	8.49	30	
Dibenzofuran	126.4	3.3	166.7	0	75.8	50 - 125	122.8	2.86	30	
Diethyl phthalate	132.2	6.6	166.7	0	79.3	50 - 125	126.5	4.35	30	
Dimethyl phthalate	127.5	6.6	166.7	0	76.5	50 - 125	123.3	3.35	30	
Di-n-butyl phthalate	155.7	6.6	166.7	0.8558	92.9	50 - 140	156.8	0.692	30	
Di-n-octyl phthalate	187.8	6.6	166.7	0	113	50 - 140	194.8	3.63	30	
Fluoranthene	142.5	3.3	166.7	1.487	84.6	50 - 131	141.7	0.517	30	
Fluorene	131.1	3.3	166.7	0	78.7	50 - 125	125	4.75	30	
Hexachlorobenzene	137.3	6.6	166.7	0	82.4	50 - 124	135	1.69	30	
Hexachlorobutadiene	129.5	6.6	166.7	0	77.7	50 - 125	126.3	2.53	30	
Hexachlorocyclopentadiene	84.05	6.6	166.7	0	50.4	45 - 135	81.77	2.74	30	
Hexachloroethane	124.8	6.6	166.7	0	74.9	45 - 125	115.1	8.15	30	
Indeno(1,2,3-cd)pyrene	159.3	3.3	166.7	0	95.6	45 - 139	159.5	0.136	30	
Isophorone	118.2	6.6	166.7	0	70.9	45 - 130	118.3	0.0551	30	
Naphthalene	122.6	3.3	166.7	0	73.6	50 - 125	121.6	0.807	30	
Nitrobenzene	121.7	6.6	166.7	0	73.0	50 - 125	121.6	0.146	30	
N-Nitrosodimethylamine	95.77	6.6	166.7	0	57.5	20 - 140	88.11	8.33	30	
N-Nitrosodi-n-propylamine	128.2	6.6	166.7	0	76.9	45 - 120	117.7	8.55	30	
N-Nitrosodiphenylamine	143.6	6.6	166.7	0	86.2	50 - 130	135.1	6.1	30	
Pentachlorophenol	131.8	6.6	166.7	0	79.1	23 - 136	121.6	8.07	30	
Phenanthrene	133.2	3.3	166.7	1.044	79.3	50 - 125	126.7	5.07	30	
Phenol	114.4	6.6	166.7	0	68.6	45 - 130	117.8	2.93	30	
Pyrene	148.7	3.3	166.7	2.521	87.7	45 - 130	149.1	0.252	30	
Surr: 2,4,6-Tribromophenol	145.4	0	166.7	0	87.3	36 - 126	139.7	3.99	30	
Surr: 2-Fluorobiphenyl	132.6	0	166.7	0	79.6	43 - 125	124.9	6.02	30	
Surr: 2-Fluorophenol	103.8	0	166.7	0	62.3	37 - 125	94.99	8.82	30	
Surr: 4-Terphenyl-d14	155.7	0	166.7	0	93.4	32 - 125	155.4	0.18	30	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: 133297		Instrument: SV-6		Method: SW8270					
MSD	Sample ID: HS18100338-02MSD	Units: ug/Kg			Analysis Date: 10-Oct-2018 14:35				
Client ID:	Run ID: SV-6_325120	SeqNo: 4766285		PrepDate: 08-Oct-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

<i>Surr: Nitrobenzene-d5</i>	124.7	0	166.7	0	74.8	37 - 125	123.3	1.17	30
<i>Surr: Phenol-d6</i>	115.6	0	166.7	0	69.4	40 - 125	111.5	3.6	30

The following samples were analyzed in this batch:

HS18100321-01	HS18100321-02	HS18100321-03	HS18100321-04
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Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260						
MBLK	Sample ID: VBLKS1-101518	Units: ug/Kg			Analysis Date: 15-Oct-2018 15:17					
Client ID:	Run ID: VOA5_325468	SeqNo: 4773356	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	< 0.50	5.0								
1,1,2,2-Tetrachloroethane	< 0.80	5.0								
1,1,2-Trichloroethane	< 0.50	5.0								
1,1-Dichloroethane	< 0.50	5.0								
1,1-Dichloroethene	< 0.50	5.0								
1,2-Dichlorobenzene	< 1.0	5.0								
1,2-Dichloroethane	< 0.60	5.0								
1,2-Dichloropropane	< 0.80	5.0								
1,3-Dichlorobenzene	< 1.0	5.0								
1,4-Dichlorobenzene	< 1.0	5.0								
2-Butanone	< 1.3	10								
2-Hexanone	< 1.4	10								
4-Methyl-2-pentanone	< 2.0	10								
Acetone	< 2.0	20								
Benzene	< 0.50	5.0								
Bromochloromethane	< 0.90	5.0								
Bromodichloromethane	< 0.50	5.0								
Bromoform	< 0.60	5.0								
Bromomethane	< 1.0	10								
Carbon disulfide	< 0.60	10								
Carbon tetrachloride	< 0.60	5.0								
Chlorobenzene	< 0.60	5.0								
Chloroethane	< 0.80	10								
Chloroform	< 0.50	5.0								
Chloromethane	< 0.50	10								
cis-1,2-Dichloroethene	< 0.80	5.0								
cis-1,3-Dichloropropene	< 0.50	5.0								
Dibromochloromethane	< 0.50	5.0								
Ethylbenzene	< 0.70	5.0								
m,p-Xylene	< 1.6	10								
Methylene chloride	< 1.0	10								
o-Xylene	< 1.0	5.0								
Styrene	< 0.70	5.0								
Tetrachloroethene	< 0.70	5.0								

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260					
MBLK	Sample ID: VBLKS1-101518	Units: ug/Kg			Analysis Date: 15-Oct-2018 15:17				
Client ID:	Run ID: VOA5_325468	SeqNo: 4773356		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Toluene	< 0.60	5.0							
trans-1,2-Dichloroethene	< 0.50	5.0							
trans-1,3-Dichloropropene	< 0.60	5.0							
Trichloroethene	< 0.60	5.0							
Vinyl acetate	< 1.0	10							
Vinyl chloride	< 0.80	2.0							
Xylenes, Total	< 1.0	5.0							
1,2-Dichloroethene, Total	< 0.50	5.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>43.41</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>86.8</i>	<i>76 - 125</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.41</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>96.8</i>	<i>80 - 120</i>			
<i>Surr: Dibromofluoromethane</i>	<i>48.02</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>96.0</i>	<i>80 - 119</i>			
<i>Surr: Toluene-d8</i>	<i>50.75</i>	<i>0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 118</i>			

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5			Method: SW8260					
LCS	Sample ID: VLCSS1-101518	Units: ug/Kg			Analysis Date: 15-Oct-2018 14:03					
Client ID:	Run ID: VOA5_325468	SeqNo: 4773355			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	54.32	5.0	50	0	109	72 - 130				
1,1,2,2-Tetrachloroethane	45.32	5.0	50	0	90.6	71 - 124				
1,1,2-Trichloroethane	45.14	5.0	50	0	90.3	78 - 117				
1,1-Dichloroethane	49.91	5.0	50	0	99.8	76 - 128				
1,1-Dichloroethene	56.66	5.0	50	0	113	72 - 130				
1,2-Dichlorobenzene	45.74	5.0	50	0	91.5	79 - 121				
1,2-Dichloroethane	45.29	5.0	50	0	90.6	77 - 120				
1,2-Dichloropropane	47.19	5.0	50	0	94.4	77 - 121				
1,3-Dichlorobenzene	48.5	5.0	50	0	97.0	78 - 121				
1,4-Dichlorobenzene	46.45	5.0	50	0	92.9	78 - 120				
2-Butanone	75.06	10	100	0	75.1	70 - 128				
2-Hexanone	80.75	10	100	0	80.7	72 - 127				
4-Methyl-2-pentanone	82.29	10	100	0	82.3	70 - 128				
Acetone	75.27	20	100	0	75.3	70 - 130				
Benzene	50.25	5.0	50	0	100	75 - 124				
Bromochloromethane	46.62	5.0	50	0	93.2	74 - 124				
Bromodichloromethane	48.26	5.0	50	0	96.5	78 - 122				
Bromoform	46.42	5.0	50	0	92.8	74 - 120				
Bromomethane	44.93	10	50	0	89.9	70 - 130				
Carbon disulfide	107.4	10	100	0	107	70 - 122				
Carbon tetrachloride	58.38	5.0	50	0	117	72 - 128				
Chlorobenzene	49.6	5.0	50	0	99.2	78 - 122				
Chloroethane	51.47	10	50	0	103	70 - 130				
Chloroform	49.14	5.0	50	0	98.3	73 - 127				
Chloromethane	50.41	10	50	0	101	70 - 130				
cis-1,2-Dichloroethene	48.29	5.0	50	0	96.6	77 - 125				
cis-1,3-Dichloropropene	48.1	5.0	50	0	96.2	78 - 122				
Dibromochloromethane	48.2	5.0	50	0	96.4	78 - 120				
Ethylbenzene	53.05	5.0	50	0	106	70 - 123				
m,p-Xylene	106.2	10	100	0	106	77 - 125				
Methylene chloride	51.44	10	50	0	103	71 - 125				
o-Xylene	51.85	5.0	50	0	104	78 - 122				
Styrene	51.52	5.0	50	0	103	80 - 123				
Tetrachloroethene	55.04	5.0	50	0	110	70 - 130				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260					
LCS	Sample ID: VLCSS1-101518	Units: ug/Kg			Analysis Date: 15-Oct-2018 14:03				
Client ID:	Run ID: VOA5_325468	SeqNo: 4773355		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Toluene	51.17	5.0	50	0	102	76 - 122			
trans-1,2-Dichloroethene	50.99	5.0	50	0	102	75 - 128			
trans-1,3-Dichloropropene	43.8	5.0	50	0	87.6	75 - 123			
Trichloroethene	52.6	5.0	50	0	105	78 - 125			
Vinyl acetate	88.55	10	100	0	88.6	70 - 130			
Vinyl chloride	53.41	2.0	50	0	107	70 - 130			
Xylenes, Total	158.1	5.0	150	0	105	77 - 128			
1,2-Dichloroethene, Total	99.27	5.0	100	0	99.3	75 - 128			
<i>Surr: 1,2-Dichloroethane-d4</i>	46.1	0	50	0	92.2	76 - 125			
<i>Surr: 4-Bromofluorobenzene</i>	50.49	0	50	0	101	80 - 120			
<i>Surr: Dibromofluoromethane</i>	47.33	0	50	0	94.7	80 - 119			
<i>Surr: Toluene-d8</i>	50.7	0	50	0	101	81 - 118			

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260						
MS	Sample ID: HS18100374-01MS	Units: ug/Kg			Analysis Date: 15-Oct-2018 16:31					
Client ID:	Run ID: VOA5_325468	SeqNo: 4773940	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	47.11	4.6	46.5	0	101	70 - 130				
1,1,2,2-Tetrachloroethane	40.24	4.6	46.5	0	86.5	70 - 130				
1,1,2-Trichloroethane	38.49	4.6	46.5	0	82.8	70 - 130				
1,1-Dichloroethane	45.62	4.6	46.5	0	98.1	70 - 130				
1,1-Dichloroethene	56.86	4.6	46.5	0	122	70 - 130				
1,2-Dichlorobenzene	33.26	4.6	46.5	0	71.5	70 - 130				
1,2-Dichloroethane	38.52	4.6	46.5	0	82.8	70 - 130				
1,2-Dichloropropane	41.67	4.6	46.5	0	89.6	70 - 130				
1,3-Dichlorobenzene	36.11	4.6	46.5	0	77.7	70 - 130				
1,4-Dichlorobenzene	34.07	4.6	46.5	0	73.3	70 - 130				
2-Butanone	73.21	9.3	93	0	78.7	70 - 130				
2-Hexanone	62.33	9.3	93	0	67.0	70 - 130				S
4-Methyl-2-pentanone	74.22	9.3	93	0	79.8	70 - 128				
Acetone	130.1	19	93	29.71	108	70 - 130				
Benzene	42.67	4.6	46.5	0	91.8	70 - 130				
Bromochloromethane	41.09	4.6	46.5	0	88.4	70 - 130				
Bromodichloromethane	42.54	4.6	46.5	0	91.5	70 - 130				
Bromoform	34.28	4.6	46.5	0	73.7	70 - 130				
Bromomethane	39.33	9.3	46.5	0	84.6	70 - 130				
Carbon disulfide	91.94	9.3	93	0	98.9	70 - 130				
Carbon tetrachloride	48.3	4.6	46.5	0	104	70 - 130				
Chlorobenzene	39.46	4.6	46.5	0	84.9	70 - 130				
Chloroethane	44.97	9.3	46.5	0	96.7	70 - 130				
Chloroform	42.73	4.6	46.5	0	91.9	70 - 130				
Chloromethane	42.03	9.3	46.5	0	90.4	70 - 130				
cis-1,2-Dichloroethene	42.7	4.6	46.5	0	91.8	70 - 130				
cis-1,3-Dichloropropene	40.92	4.6	46.5	0	88.0	70 - 130				
Dibromochloromethane	38.76	4.6	46.5	0	83.3	70 - 130				
Ethylbenzene	43.54	4.6	46.5	0	93.6	70 - 130				
m,p-Xylene	84.12	9.3	93	0	90.4	70 - 130				
Methylene chloride	46.37	9.3	46.5	0	99.7	70 - 130				
o-Xylene	40.48	4.6	46.5	0	87.1	70 - 130				
Styrene	35.56	4.6	46.5	0	76.5	70 - 130				
Tetrachloroethene	45.63	4.6	46.5	0	98.1	70 - 130				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260						
MS	Sample ID: HS18100374-01MS	Units: ug/Kg			Analysis Date: 15-Oct-2018 16:31					
Client ID:	Run ID: VOA5_325468	SeqNo: 4773940		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	44.11	4.6	46.5	0	94.9	70 - 130				
trans-1,2-Dichloroethene	44.96	4.6	46.5	0	96.7	70 - 130				
trans-1,3-Dichloropropene	35.83	4.6	46.5	0	77.0	70 - 130				
Trichloroethene	43.4	4.6	46.5	0	93.3	70 - 130				
Vinyl acetate	56.12	9.3	93	0	60.3	70 - 130				S
Vinyl chloride	44.32	1.9	46.5	0	95.3	70 - 130				
Xylenes, Total	124.6	4.6	139.5	0	89.3	70 - 130				
1,2-Dichloroethene, Total	87.66	4.6	93	0	94.3	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>42.88</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>92.2</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>44.89</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>96.5</i>	<i>70 - 130</i>				
<i>Surr: Dibromofluoromethane</i>	<i>45.08</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>97.0</i>	<i>70 - 130</i>				
<i>Surr: Toluene-d8</i>	<i>45.96</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>98.8</i>	<i>70 - 130</i>				

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260						
MSD	Sample ID: HS18100374-01MSD	Units: ug/Kg			Analysis Date: 15-Oct-2018 16:55					
Client ID:	Run ID: VOA5_325468	SeqNo: 4773941	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	49.39	4.6	46.5	0	106	70 - 130	47.11	4.72	30	
1,1,2,2-Tetrachloroethane	35.65	4.6	46.5	0	76.7	70 - 130	40.24	12.1	30	
1,1,2-Trichloroethane	37.74	4.6	46.5	0	81.2	70 - 130	38.49	1.97	30	
1,1-Dichloroethane	45.66	4.6	46.5	0	98.2	70 - 130	45.62	0.0932	30	
1,1-Dichloroethene	48.31	4.6	46.5	0	104	70 - 130	56.86	16.3	30	
1,2-Dichlorobenzene	28.2	4.6	46.5	0	60.6	70 - 130	33.26	16.5	30	S
1,2-Dichloroethane	39.17	4.6	46.5	0	84.2	70 - 130	38.52	1.69	30	
1,2-Dichloropropane	42.4	4.6	46.5	0	91.2	70 - 130	41.67	1.72	30	
1,3-Dichlorobenzene	31.8	4.6	46.5	0	68.4	70 - 130	36.11	12.7	30	S
1,4-Dichlorobenzene	28.41	4.6	46.5	0	61.1	70 - 130	34.07	18.1	30	S
2-Butanone	73.49	9.3	93	0	79.0	70 - 130	73.21	0.387	30	
2-Hexanone	67.02	9.3	93	0	72.1	70 - 130	62.33	7.25	30	
4-Methyl-2-pentanone	73.1	9.3	93	0	78.6	70 - 128	74.22	1.52	30	
Acetone	129.9	19	93	29.71	108	70 - 130	130.1	0.138	30	
Benzene	44.73	4.6	46.5	0	96.2	70 - 130	42.67	4.74	30	
Bromochloromethane	40.68	4.6	46.5	0	87.5	70 - 130	41.09	1	30	
Bromodichloromethane	40.35	4.6	46.5	0	86.8	70 - 130	42.54	5.28	30	
Bromoform	33.32	4.6	46.5	0	71.7	70 - 130	34.28	2.83	30	
Bromomethane	37.66	9.3	46.5	0	81.0	70 - 130	39.33	4.34	30	
Carbon disulfide	90.81	9.3	93	0	97.6	70 - 130	91.94	1.23	30	
Carbon tetrachloride	50.37	4.6	46.5	0	108	70 - 130	48.3	4.2	30	
Chlorobenzene	37.99	4.6	46.5	0	81.7	70 - 130	39.46	3.8	30	
Chloroethane	43.37	9.3	46.5	0	93.3	70 - 130	44.97	3.63	30	
Chloroform	43.48	4.6	46.5	0	93.5	70 - 130	42.73	1.74	30	
Chloromethane	42.25	9.3	46.5	0	90.9	70 - 130	42.03	0.527	30	
cis-1,2-Dichloroethene	43.71	4.6	46.5	0	94.0	70 - 130	42.7	2.34	30	
cis-1,3-Dichloropropene	38.87	4.6	46.5	0	83.6	70 - 130	40.92	5.15	30	
Dibromochloromethane	36.91	4.6	46.5	0	79.4	70 - 130	38.76	4.89	30	
Ethylbenzene	41.83	4.6	46.5	0	89.9	70 - 130	43.54	4.02	30	
m,p-Xylene	80.5	9.3	93	0	86.6	70 - 130	84.12	4.39	30	
Methylene chloride	42.89	9.3	46.5	0	92.2	70 - 130	46.37	7.79	30	
o-Xylene	39.74	4.6	46.5	0	85.5	70 - 130	40.48	1.85	30	
Styrene	34	4.6	46.5	0	73.1	70 - 130	35.56	4.5	30	
Tetrachloroethene	44.86	4.6	46.5	0	96.5	70 - 130	45.63	1.69	30	

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325468		Instrument: VOA5		Method: SW8260						
MSD	Sample ID: HS18100374-01MSD	Units: ug/Kg			Analysis Date: 15-Oct-2018 16:55					
Client ID:	Run ID: VOA5_325468	SeqNo: 4773941		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Toluene	42.97	4.6	46.5	0	92.4	70 - 130	44.11	2.61	30	
trans-1,2-Dichloroethene	44.1	4.6	46.5	0	94.8	70 - 130	44.96	1.93	30	
trans-1,3-Dichloropropene	35.5	4.6	46.5	0	76.3	70 - 130	35.83	0.929	30	
Trichloroethene	41.93	4.6	46.5	0	90.2	70 - 130	43.4	3.44	30	
Vinyl acetate	45.65	9.3	93	0	49.1	70 - 130	56.12	20.6	30	S
Vinyl chloride	43.88	1.9	46.5	0	94.4	70 - 130	44.32	1	30	
Xylenes, Total	120.2	4.6	139.5	0	86.2	70 - 130	124.6	3.56	30	
1,2-Dichloroethene, Total	87.81	4.6	93	0	94.4	70 - 130	87.66	0.173	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.01</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>94.6</i>	<i>70 - 126</i>	<i>42.88</i>	<i>2.59</i>	<i>30</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>46.6</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>100</i>	<i>70 - 130</i>	<i>44.89</i>	<i>3.74</i>	<i>30</i>	
<i>Surr: Dibromofluoromethane</i>	<i>45.47</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>97.8</i>	<i>70 - 130</i>	<i>45.08</i>	<i>0.849</i>	<i>30</i>	
<i>Surr: Toluene-d8</i>	<i>46.85</i>	<i>0</i>	<i>46.5</i>	<i>0</i>	<i>101</i>	<i>70 - 130</i>	<i>45.96</i>	<i>1.9</i>	<i>30</i>	

The following samples were analyzed in this batch: HS18100321-01 HS18100321-02 HS18100321-03 HS18100321-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325118		Instrument: WetChem_HS		Method: SW9045B						
DUP	Sample ID: HS18100359-03DUP	Units: pH Units		Analysis Date: 10-Oct-2018 13:15						
Client ID:	Run ID: WetChem_HS_325118	SeqNo: 4766011		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH	8.04	0.100					8.05	0.124	10	
Temp Deg C @pH	21	0					21	0	10	

The following samples were analyzed in this batch:

HS18100321-01	HS18100321-02	HS18100321-03	HS18100321-04
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Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325330		Instrument: WetChem_HS		Method: SW7.3.4.2					
MBLK	Sample ID: MBLK-325330	Units: mg/Kg		Analysis Date: 12-Oct-2018 11:30					
Client ID:	Run ID: WetChem_HS_325330	SeqNo: 4770391		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Reactive Sulfide	< 100	100							

LCS		Sample ID: LCS-325330		Units: mg/Kg		Analysis Date: 12-Oct-2018 11:30			
Client ID:	Run ID: WetChem_HS_325330	SeqNo: 4770392		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Reactive Sulfide	68	10.0	100	0	68.0	20 - 120			

MS		Sample ID: HS18100363-01MS		Units: mg/Kg		Analysis Date: 12-Oct-2018 11:30			
Client ID:	Run ID: WetChem_HS_325330	SeqNo: 4770394		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Reactive Sulfide	64	10.0	100	0	64.0	20 - 120			

The following samples were analyzed in this batch:

HS18100321-01	HS18100321-02	HS18100321-03	HS18100321-04
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Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325337	Instrument: UV-2450	Method: SW7.3.3.2
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MBLK	Sample ID: MBLK-325337	Units: mg/Kg	Analysis Date: 12-Oct-2018 13:30							
Client ID:	Run ID: UV-2450_325337	SeqNo: 4770431	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Reactive Cyanide < 100 100

LCS	Sample ID: LCS-325337	Units: mg/Kg	Analysis Date: 12-Oct-2018 13:30							
Client ID:	Run ID: UV-2450_325337	SeqNo: 4770432	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Reactive Cyanide 0.63 10.0 10 0 6.30 5 - 100 J

MS	Sample ID: HS18100363-01MS	Units: mg/Kg	Analysis Date: 12-Oct-2018 13:30							
Client ID:	Run ID: UV-2450_325337	SeqNo: 4770434	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Reactive Cyanide 0.71 10.0 10 0 7.10 5 - 100 J

The following samples were analyzed in this batch: HS18100321-01 HS18100321-02 HS18100321-03 HS18100321-04

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

QC BATCH REPORT

Batch ID: R325453	Instrument: WetChem_HS	Method: SW1030
--------------------------	-------------------------------	-----------------------

DUP	Sample ID: HS18100321-04DUP	Units: Burn Rate, mm/sec	Analysis Date: 15-Oct-2018 14:00							
Client ID: NAPL-1620-TPB13-20181005	Run ID: WetChem_HS_325453	SeqNo: 4773034	PrepDate: DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Ignitability, Solid	Negative	0					0	0	25
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The following samples were analyzed in this batch:

HS18100321-01	HS18100321-02	HS18100321-03	HS18100321-04
---------------	---------------	---------------	---------------

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
WorkOrder: HS18100321

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/Kg	Milligrams per Kilogram

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Client: Golder Associates Inc.
Project: Houston TX-Wood Preserving Works
Work Order: HS18100321

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18100321-01	NAPL-1620-TPB105-20181005	Login	10/5/2018 5:30:39 PM	JRM	SPA277
HS18100321-01	NAPL-1620-TPB105-20181005	Login	10/5/2018 5:30:39 PM	JRM	SPA177
HS18100321-01	NAPL-1620-TPB105-20181005	Login	10/5/2018 5:30:39 PM	JRM	SPA277

Sample Receipt Checklist

Client Name: PBW
 Work Order: HS18100321

Date/Time Received: **05-Oct-2018 15:40**
 Received by: **DJW**

Checklist completed by: Jared R. Makan 5-Oct-2018 Reviewed by: Dane J. Wacasey 19-Oct-2018
 eSignature Date eSignature Date

Matrices: **Soil** Carrier name: **Client**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- TX1005 solids received in hermetically sealed vials? Yes No N/A
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace? Yes No No VOA vials submitted

Water - pH acceptable upon receipt? Yes No N/A

pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

Corrective Action:



Cincinnati, OH
+1 513 733 5336

Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 189277

HS18100321

Golder Associates Inc.
Houston TX-Wood Preserving Works



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-12-Rev0 SR 92688
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street
			Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	Eric_Matzner@golder.com	e-Mail Address	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SO-1620-TPSoils-20181005	10/5/18	10:30AM	Soil	8	3	X	X	X	X			X	X	X		
2	SO-1620-TPSoil(2-3)-20181005	10/5/18	8:00AM	Soil	8	1	X	X	X	X	X	X	X	X	X		
3	NAPL-1620-TPB105-20181005		7:30 AM	Product	8	2			X		X	X	X	X	X	X	
4	NAPL-1620-TPB100-20181005		8:00AM	Product	8	2			X		X	X	X	X	X	X	
5	NAPL-1620-TPB54-20181005		8:00AM	Product	8	1			X		X	X	X	X	X	X	
6	NAPL-1620-TPB13-20181005		8:45AM	Product	8	2			X		X	X	X	X	X	X	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign BRYAN LUPE		Shipment Method HAND DELIVER		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> 10 NAPL				Results Due Date: SOIL 3 DAY TAT				
Relinquished by: Bryan Lupe		Date: 10/5/18	Time: 1540	Received by:		Notes: UPRR Houston MWPW						
Relinquished by:		Date: 10/5/18	Time: 1540	Received by (Laboratory):		Cooler ID: MED RED		Cooler Temp.: 2.1°C		QC Package: (Check One Box Below)		
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):						<input checked="" type="checkbox"/> Level II Std QC <input type="checkbox"/> Level III Std QC/Raw Date <input type="checkbox"/> Level IV SW846/CLP <input type="checkbox"/> Other		
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035												

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

(R25 of +0.3°C

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ATTACHMENT C

**TCEQ TRRP Tier 1 TPH PCL
Calculator Results**

TCEQ TRRP Tier 1 TPH PCL Calculator (v 2.0 - 12/2016) for TCEQ Method 1006 Data - Input Sheet

Site Information:		UPRR Englewood IM Yard	Sample ID:		NAPL-1620-TPB100-20181005	Calculation Date:		October 30, 2018	
		▼ INPUT ▼			$MF_i = \frac{C_i}{\sum_{i=1}^{13} C_i}$	MF_i / MW_i	$X_i = \frac{(MF_i / MW_i)}{\sum_{i=1}^{13} (MF_i / MW_i)}$	$C_{sat,i} = S \cdot X_i \left[\frac{\theta_w + K_d \rho_s + \theta_w H'}{\rho_s} \right]$	$C_i > C_{sat,i} ?$
TCEQ Method 1006 Boiling Point Range	i	TCEQ Method 1006 Boiling Point Range Concentrations in Soil Ci (mg/kg)	Boiling Point Range Molecular Weight ¹	Boiling Point Range Mass Fraction MFi (-)	Mass Fraction / Molecular Wt Ratio MFi/MWi (mol/g)	Boiling Point Range Mole Fraction Xi (-)	Theoretical Soil Saturation Limit for TPH NAPL Csat, i (mg/kg)	Test for Theoretical Saturation Limit (C _{sat,i})	
>C ₆ - C ₉ Aliphatic	1	0.00 mg/kg	81	-	-	-	-	-	
>C ₈ - C ₁₀ Aliphatic	2	4.80 mg/kg	100	2.47E-04	2.47E-06	4.72E-04	3.66E-02	Csat,2 EXCEEDED	
>C ₁₀ - C ₁₂ Aliphatic	3	4.80 mg/kg	130	2.47E-04	1.90E-06	3.63E-04	1.16E-02	Csat,3 EXCEEDED	
>C ₁₂ - C ₁₆ Aliphatic	4	4.80 mg/kg	160	2.47E-04	1.54E-06	2.95E-04	5.20E-03	Csat,4 EXCEEDED	
>C ₁₆ - C ₂₁ Aliphatic	5	4.80 mg/kg	200	2.47E-04	1.23E-06	2.36E-04	1.81E-03	Csat,5 EXCEEDED	
>C ₂₁ - C ₃₅ Aliphatic	6	47.00 mg/kg	270	2.42E-03	8.95E-06	1.71E-03	5.41E-03	Csat,6 EXCEEDED	
>C ₇ - C ₉ Aromatic	7	50.00 mg/kg	270	2.57E-03	9.52E-06	1.82E-03	5.75E-03	Csat,7 EXCEEDED	
>C ₉ - C ₁₀ Aromatic	8	480.00 mg/kg	92	2.47E-02	2.68E-04	5.14E-02	1.12E+01	Csat,8 EXCEEDED	
>C ₁₀ - C ₁₂ Aromatic	9	480.00 mg/kg	120	2.47E-02	2.06E-04	3.94E-02	8.51E+00	Csat,9 EXCEEDED	
>C ₁₂ - C ₁₆ Aromatic	10	480.00 mg/kg	130	2.47E-02	1.90E-04	3.63E-02	4.67E+00	Csat,10 EXCEEDED	
>C ₁₆ - C ₂₁ Aromatic	11	1,800.00 mg/kg	150	9.25E-02	6.17E-04	1.18E-01	6.94E+00	Csat,11 EXCEEDED	
>C ₂₁ - C ₃₅ Aromatic	12	8,300.00 mg/kg	190	4.27E-01	2.25E-03	4.30E-01	8.89E+00	Csat,12 EXCEEDED	
	13	7,800.00 mg/kg	240	4.01E-01	1.67E-03	3.20E-01	5.32E-01	Csat,13 EXCEEDED	
Sum Aliphatic Fraction:		116.20 mg/kg	0.0060	$\sum MF_i$	$\sum (MF_i / MW_i)$	$\sum X_i$			
Sum Aromatic Fraction:		19,340.00 mg/kg	0.9940	= 1.00E+00	= 5.22E-03 mol/g	= 1.00E+00			
SumTotal TPH:		19,456.20 mg/kg	1.0000	from TRRP Table [§350.73(4)]					

TCEQ TRRP Tier 1 TPH PCL Calculator (v 2.0 - 12/2016) for TCEQ Method 1006 Data - Results

TPH NAPL Present?:	Theoretical soil saturation limit IS EXCEEDED for one or more TPH fractions - Presence of NAPL is indicated - See TRRP-32 for NAPL management guidance			
Mobile NAPL Present?:	Presence of Mobile NAPL IS indicated - See TRRP-32 for guidance on the Mobile NAPL Trigger			
Tier 1 ^{Tot} SOIL _{Comb}	0.5 Acre Residential	30 Acre Residential	0.5 Acre Comm / Ind	30 Acre Comm / Ind
PCL _{TPH Mix} =	4.69E+03 mg/kg	4.69E+03 mg/kg	4.69E+04 mg/kg	4.69E+04 mg/kg
Hazard Index (HI) of TPH _{Mix} =	2.28	2.36	2.81	3.41
Tier 1 ^{GW} SOIL _{Ing}	0.5 Acre Residential	30 Acre Residential	0.5 Acre Comm / Ind	30 Acre Comm / Ind
PCL _{TPH Mix} =	HI<10; GW-Soil-Ing PCL not needed *	HI<10; GW-Soil-Ing PCL not needed *	HI<10; GW-Soil-Ing PCL not needed *	HI<10; GW-Soil-Ing PCL not needed *
Hazard Index (HI) of TPH _{Mix} =	0.79	1.58	0.27	0.53
Tier 1 ^{GW} SOIL _{Class 3}	0.5 Acre Residential	30 Acre Residential	0.5 Acre Comm / Ind	30 Acre Comm / Ind
PCL _{TPH Mix} =	HI<10; GW-Soil-Ing PCL not needed *	HI<10; GW-Soil-Ing PCL not needed *	HI<10; GW-Soil-Ing PCL not needed *	HI<10; GW-Soil-Ing PCL not needed *
Hazard Index (HI) of TPH _{Mix} =	0.01	0.02	0.00	0.01
Tier 1 ^{Air} SOIL _{Inh-V}	0.5 Acre Residential	30 Acre Residential	0.5 Acre Comm / Ind	28 Acre Comm / Ind
PCL _{TPH Mix} =	1.26E+05 mg/kg	6.49E+04 mg/kg	1.74E+05 mg/kg	8.92E+04 mg/kg
Hazard Index (HI) of TPH _{Mix} =	2.36	2.36	2.35	2.32

This work sheet is for inputting the TCEQ Method 1006 soil concentrations and summarizing the PCL calculation results. End of work sheet.