DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: **Northeast Environmental Services, Inc. (NES)**
Facility Address: **4123 Canal Road, Wampsville NY**
Facility EPA ID #: **NYD057770109**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__X__ If yes - check here and continue with #2 below.

_____ If no - re-evaluate existing data, or

_____ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__X__ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Based upon the results of numerous past investigations and routine groundwater monitoring, it has been determined that hazardous waste constituents have been released to the soil and groundwater beneath the NES facility. Samples of soil and groundwater have demonstrated contamination at levels exceeding New York State soil and groundwater standards within the upper aquifer (an approximately 30 - 35 foot thick fine silty sand unit). This upper aquifer is directly underlain by a dense silty glacial till, which appears to be continuous beneath the contaminated areas . Some wells and piezometer have been installed below the till layer, in areas that are not contaminated. These monitoring points, adjacent to upper aquifer monitoring points, have all indicated an upward hydraulic gradient, which would further reduce the likelihood of any deeper contamination. If ongoing studies of the source areas indicate that dense non-aqueous phase liquid (DNAPL) contaminants may have migrated to the till layer, deeper groundwater investigations could become necessary. At this point, available data do not suggest significant DNAPL migration below the source areas.

The most significant contamination has been by volatile organic contaminants, which are residual in the site soils (including those under the site structures). These have entered the groundwater and have migrated to the north across the length of the facility. The most recent studies performed in 2003 and 2004 concluded that groundwater contamination extends a short distance off-site. Groundwater in principally contaminated with Trichloroethylene (TCE), Trichloroethane (TCA), daughter products, and Vinyl Chloride. Historically, vinyl chloride has been detected in concentrations ranging from less than 1 part per billion to over 5 parts per million. It is believed that vinyl chloride monomer was present in wastes handled and spilled historically at the facility and that the vinyl chloride found in the groundwater, for the most part is not the result of breakdown of other parent compounds. Benzene, toluene, ethyl benzene, and xylene (BTEX) compounds are present in the groundwater near the source areas within the shallow portion (upper 15 feet of saturated sands) of the aquifer, but have not been detected more than a few 100 feet downgradient from the sources. No change in this condition has occurred over the approximately 20 years of monitoring. Thus, these compounds apparently are being effectively bio-degraded in the upper groundwater. Groundwater and Drinking Water Standards are 5 parts-per-billion for most of the VOC contaminants. The groundwater standard for vinyl chloride is 2 parts-per-billion.

The key contaminants at the NES site for this CA-750 determination are vinyl chloride and chloroethane. These are the only contaminants that have been detected beyond Pumping Well 5D in concentrations exceeding groundwater standard.

Vinyl chloride has been detected in concentrations of up to 10 ppb (Well WP-107D).

Chloroethane has been detected at concentrations up to 310 ppb (Well WP-16D), although the chloroethane concentration reduced to less than 100 ppb shortly after pumping was begun at WP-

5D in 1998, and it has remained below 100 ppb in this well for the subsequent 6 years. Concentrations of chloroethane in the 100 - 200 ppb range have been detected near the northern property line (downgradient of WP-16D) in two monitoring points dating from the late 1990s to 2003 - Temporary Well B-3 (120 ppb) and Well 105D (190 ppb).

Thus, it appears that very little groundwater quality change has occurred in the area immediately beyond of the capture of Pumping Well 5D, since its start up in 1998. This fact supports the effectiveness of the groundwater recovery system to capture and contain continuing releases from the remaining source material near and beneath the operation building. Further, only very low levels of chloroethane and vinyl chloride were detected in Monitoring Point A-6 (10 ppb - 13 ppb). This contamination extends approximately 200 - 250 feet from the property line, strongly suggesting that the fugitive pool of contaminated groundwater north of the capture area (see Figure 7) is not sufficient to cause further expansion of the plume and that it has most likely stabilized.

The following Figures are attached to this CA-750 Document:

Figure 1: Site Location Map
Figure 2: Site Map/Shallow Groundwater Flow Map (October 2002)
Figure 3: Shallow VOC Concentration Map (October 1999)
Figure 4: Deep Groundwater Contour Map (February 2002)
Figure 5: Deep Groundwater Contour Map (June 2002)
Figure 6: Deep Off-Site Groundwater Contour Map (July 21, 2004)
Figure 7: Generalized Deep Off-Site TVOC Plume Map

Additional information on the hydrogeologic conditions and environmental impacts from the site were provided in portions of the CA-725 "Current Human Exposures Under Control" (Completed in 2003). Relevant excerpts from the CA-725 can be found in Attachment 1, located at the back of this document. All work items noted in Attachment 1, as still necessary for the completion of a CA-750, have since been completed, and the discussions within the body of this CA-750 document shall take precedence over those in Attachment 1, where any discrepancies occur.

References:

Subsurface Soil and Groundwater Remedial Investigation Report for the Former Northeast Environmental Services, Inc. Site, Strategic Environmental Management, Inc., December 23, 2002.
1999 Annual/2000 First Quarter Groundwater Monitoring System Report Northeast Environmental Services, Inc.,MEI Environmental Group, Inc., July 2000.
RCRA Facility Investigation: Soil Northeast Environmental Services, Inc., INTEX, November 4, 1992.

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

__X__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): In order to contain and treat the contaminated groundwater, a groundwater extraction (Recovery Well R-1) and treatment system was installed at the site in April 1993. The groundwater treatment system was designed to operate at a rate of up twenty (20) gallons per minute and has operated continuously since installation. In April 1998, the groundwater extraction system was modified, by the addition of a second withdrawal well (conversion of Monitoring Well MW-5D to a second extraction well), after monitoring data showed significantly increasing vinyl chloride levels in this well, which is located near the containment limits of the original pumping well.

Piezometric monitoring data (Figures 2, 4, and 5) show that adequate capture exists for control of contaminated groundwater resulting from continuing releases from the unremediated sources beneath and adjacent to the operations building. However, the northern extent of the contaminant plume had not been adequately defined, and it was not known whether the plume extended beyond the effective capture capability of Recovery Well 5D, and/or if contamination had migrated beyond the northern facility boundary. Studies performed in 2002 and 2003 (and some earlier data) suggested that a portion of the VOC plume may be migrating off-site.

In 2004 a study was conducted jointly by USEPA and NYSDEC to conclusively investigate the off-site migration potential and, if contamination was found, its full extent. The results of this study, which are shown on Figure 6 and Figure 7, indicated that chloroethane and vinyl chloride have migrated off-site and that a small area of relatively low level contamination has escaped the reach of Recovery Well 5D. The 2004 study defined the northwestern extent of the plume, through the installation and sampling of an extensive off-site array of temporary sampling points. Only one sampling point (A-6) detected the presence of VOCs. Sampling points located cross-gradient and downgradient from this point did not detect the presence of any VOCs. Vinyl chloride was found at point A-6 at less than 1 ppb and chloroethane was detected at 11 ppb by USEPA's mobile lab on-site. A second sample, collected from A-6 and submitted to a local New York State approved analytical lab (Life Sciences), confirmed the chloroethane at 13 ppb. Figure 7 presents the northern property and off-site data in a generalized format. The VOC plume is shown to extend beyond the reach of Recovery Well 5D and a short distance off-site. The concentrations contours have been conservatively drawn to represent the likely worst case.

The NYSDEC and USEPA have determined that Site groundwater migration is under control, and that the small fugitive volume of contaminated groundwater, extending beyond the reach of the current recovery wells does not warrant further evaluation or installation of additional recovery wells. Groundwater contamination from remaining sources has been under control since 1998 (6 years). Average groundwater flow velocity has been determined to be in the range of 75 - 100 feet per year, for the upper aquifer,

however, higher velocities are likely within preferential flow zones consisting of coarser and cleaner sand lenses. Therefore, where contaminated groundwater is present beyond the recovery wells' capture area, it can be expected that the plume would have migrated away from the site a distance of least 400 to 600 feet since pumping at Well 5D was begun 6 years ago. Given that the groundwater plume has now been determined to extend only 200 - 250 feet downgradient from the extent of capture, it is reasonable to assume that the plume is naturally attenuating, and has stabilized. There are no groundwater users in the immediate vicinity of the site. The nearest private wells are approximately 2000 feet away and have been sampled periodically over the last 20 years by the New York State Health Department. No site related contamination has ever been indicated in any of the wells sampled. Due to the low levels and small volume of the fugitive groundwater contamination, installation and monitoring of off-site groundwater monitoring wells is not proposed. Future monitoring will consist of routine monitoring of on-site wells, as well as continued monitoring of local private wells on a periodic basis (every 3 years). Even though the plume has been defined and has most likely stabilized, the private well sampling will be performed to provide an extra factor of safety.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

__X__ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): Contaminated groundwater from this site does not discharge to surface water. During the investigation performed during July 2004, water levels were taken multiple times at multiple locations along the east/west drainage ditch just beyond the northern limits of the site. The relatively stagnant water in the ditch was found to be at an elevation above the groundwater, so it has been determined that groundwater was not discharging to this surface feature, during this time frame. Groundwater contamination is within the lower 15 feet of the upper aquifer in the area of the ditch, so even if groundwater discharges to it at other times of the year, it does not contain site constituents. (Reference: **Figure 3,** for extent of shallow groundwater contamination.).

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5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

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_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>key</u> contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and
Reference(s)_____

_____

_____

____

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and
Reference(s):_____
_____
_____
_____
_____
_____
_____
_____

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): Routine monitoring of on-site wells and off-site private wells will be performed as described under Section 3, above, to provide data to demonstrate that migration of significant levels of groundwater contamination will not extend beyond the "existing area of groundwater contamination". The levels of contamination found beyond the site, and beyond the capture of the recovery wells, has been determined to be of an insignificant volume and concentration such that they are "appropriate for the protection of the groundwater resource and its beneficial uses" and do not require additional off-site verification monitoring. If contaminant levels of on-site wells increase or other data become available suggesting that higher levels may be bypassing the recovery wells and/or migrating off-site this determination will be re-evaluated.

Migration of Contaminated Groundwater Under Control
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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Northeast Environmental Services facility , EPA ID # NYD057770109 , located at 4123 Canal Road, Wampsville NY. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by (signature)_____ Date _____
(print) Gary D. Casper
(title) Engineering Geologist 2

Supervisor (signature)_____ Date _____
(print) William E. Wertz
(title) Engineering Geologist 3
(EPA Region or State) New York State

Director Original signed by: Date: 9/30/2004
(print) Edwin Dassetti, P.E.
(title) Director, Bureau of Hazardous Waste& Radiation Management
Division of Solid and Hazardous Materials
NYSDEC

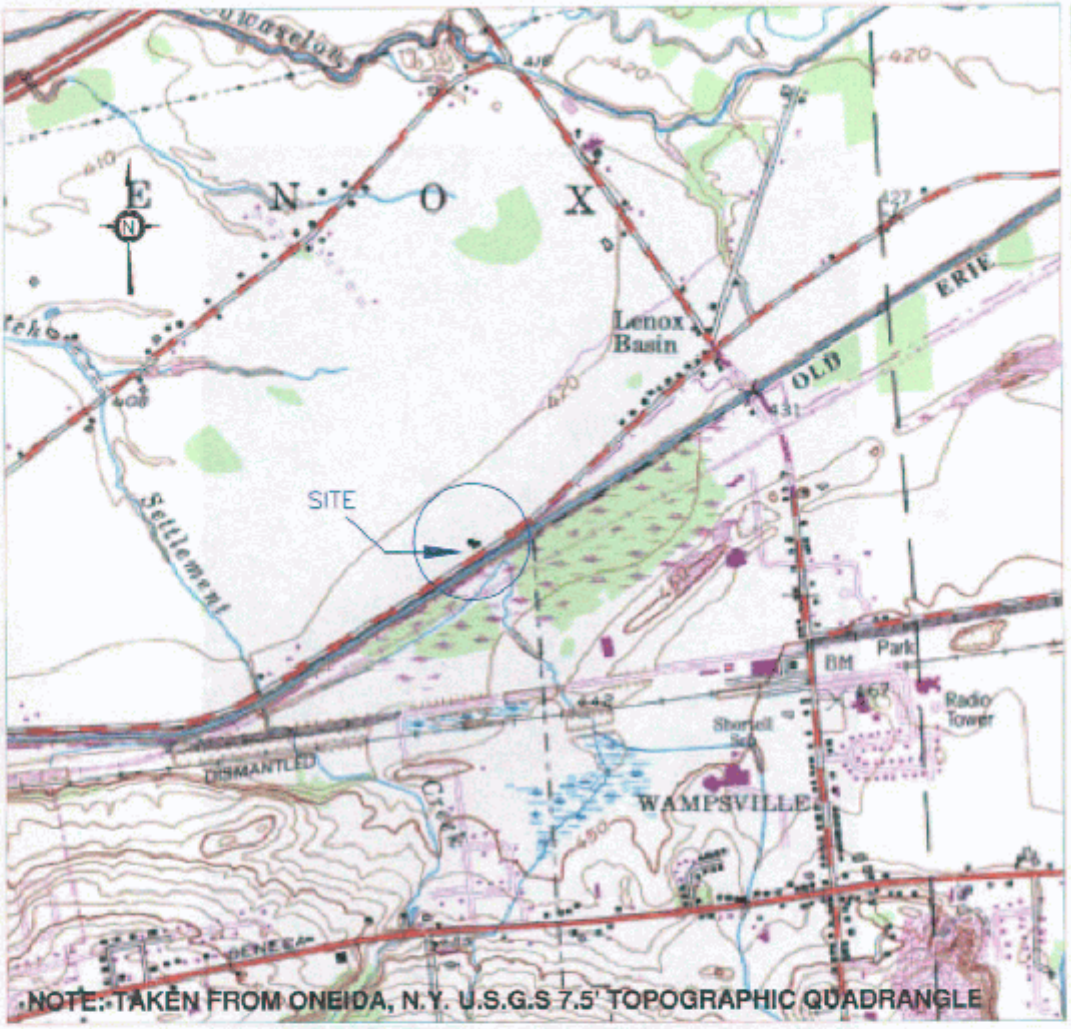
Locations where References may be found:

NYSDEC
625 Broadway
Albany, New York 12233

Contact telephone and e-mail numbers

(name) Gary D. Casper
(phone #) (518) 402-8594
(e-mail) gdcasper@gw.dec.state.ny.us

FIGURES



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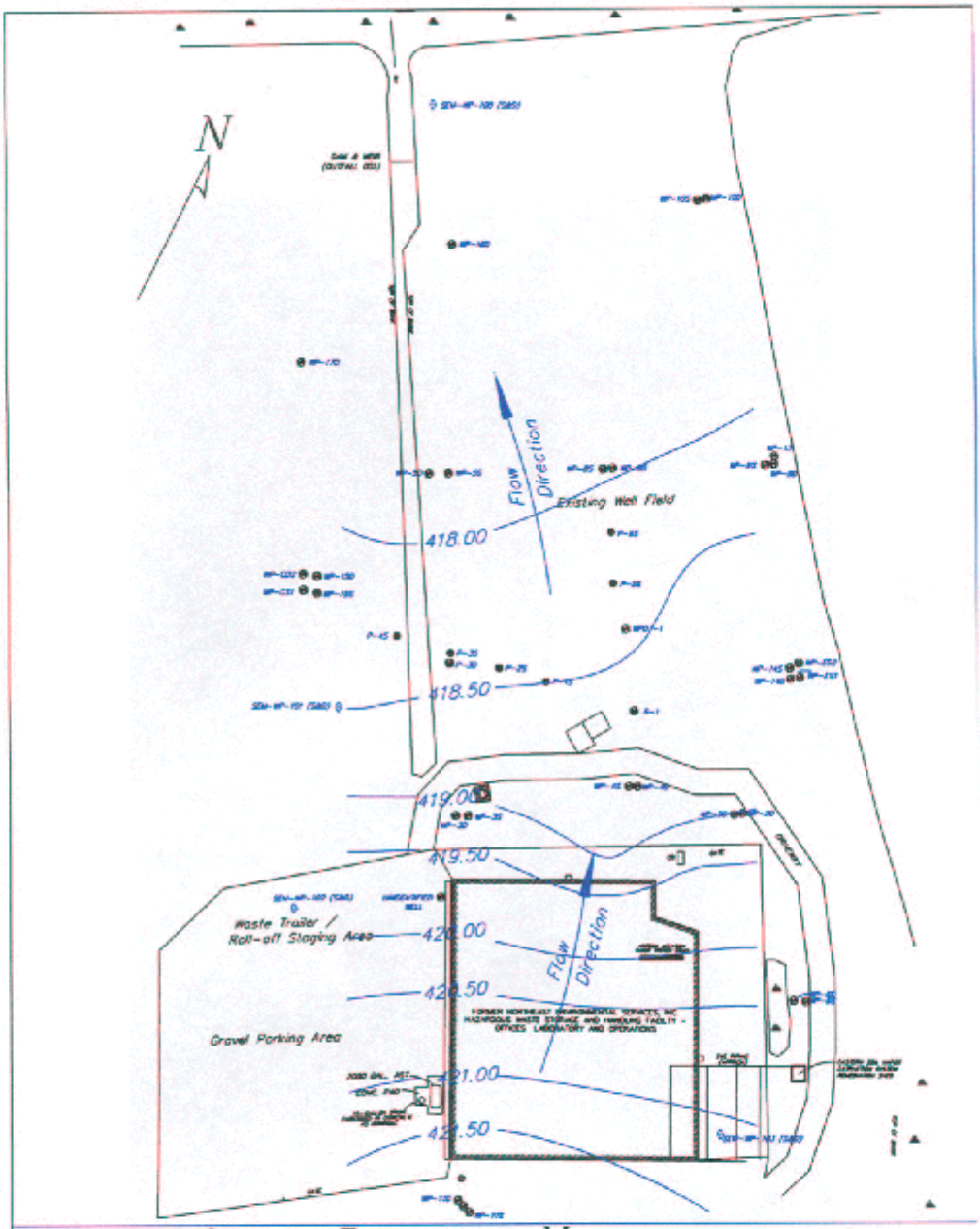
Telephone: (315) 635-8936 Facsimile: (315) 635-2380

FORMER NORTHEAST ENVIRONMENTAL SERVICES SITE
4123 Canal Road
Town of Lenox, Madison County, New York
NYSDEC SPILL NO. 01-60024/PIN No. H-0529

FIGURE 1

SEM PROJECT NUMBER

DATE:



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FORMER NORTHEAST ENVIRONMENTAL SERVICES INC.
CANAL ST. ROAD, CANASTOTA, NY
NYSDEC SPILL NO. 01-80024 / PIN NO. H-0529

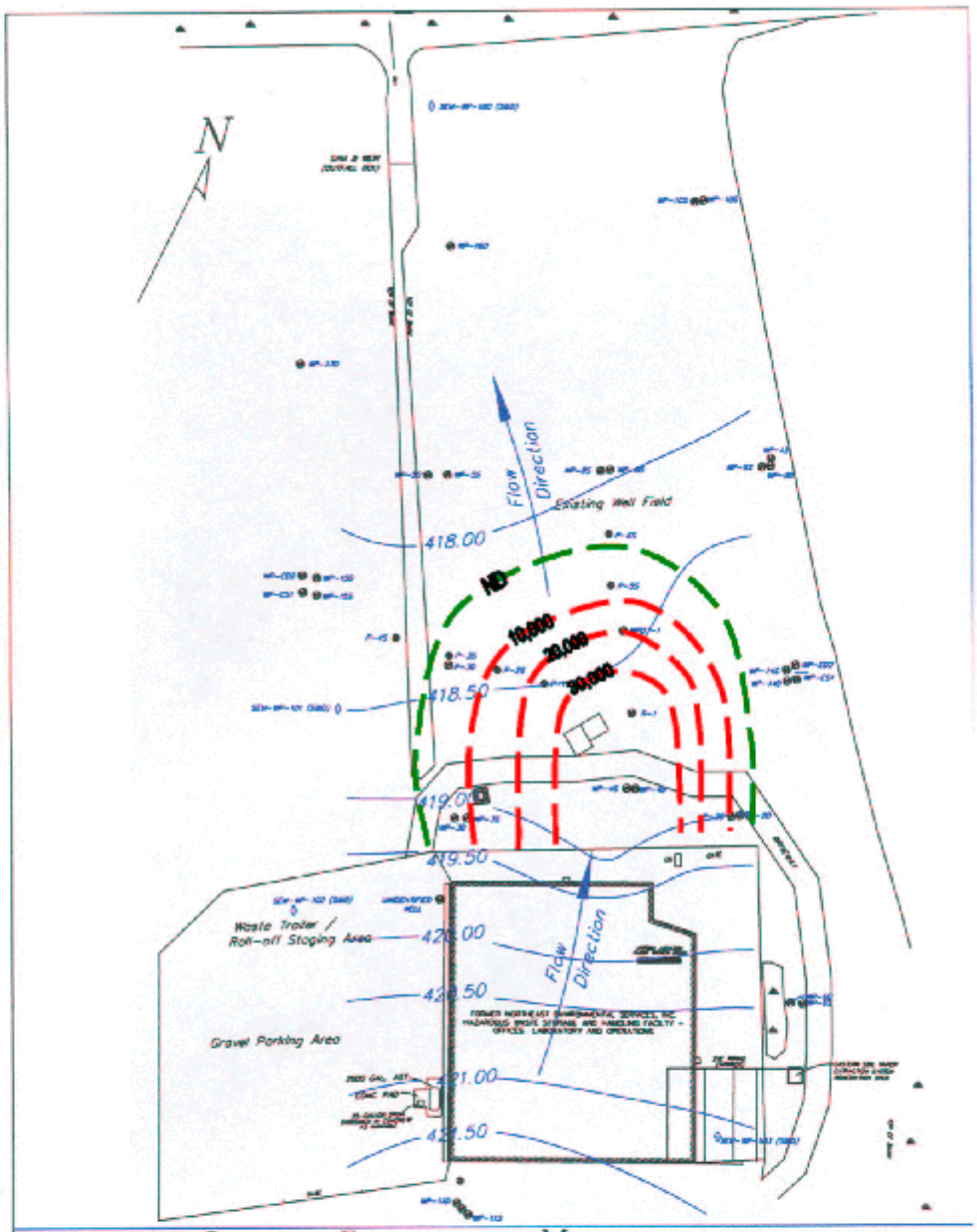
SEM PROJ. NO. 3003.050.12.02

DATE: December 5, 2002

EDITED BY: CKP File: NES-Shallow GW 10-28-02.dwg

FIGURE 2

SITE MAP/SHALLOW GROUNDWATER FLOW
OCTOBER 2002



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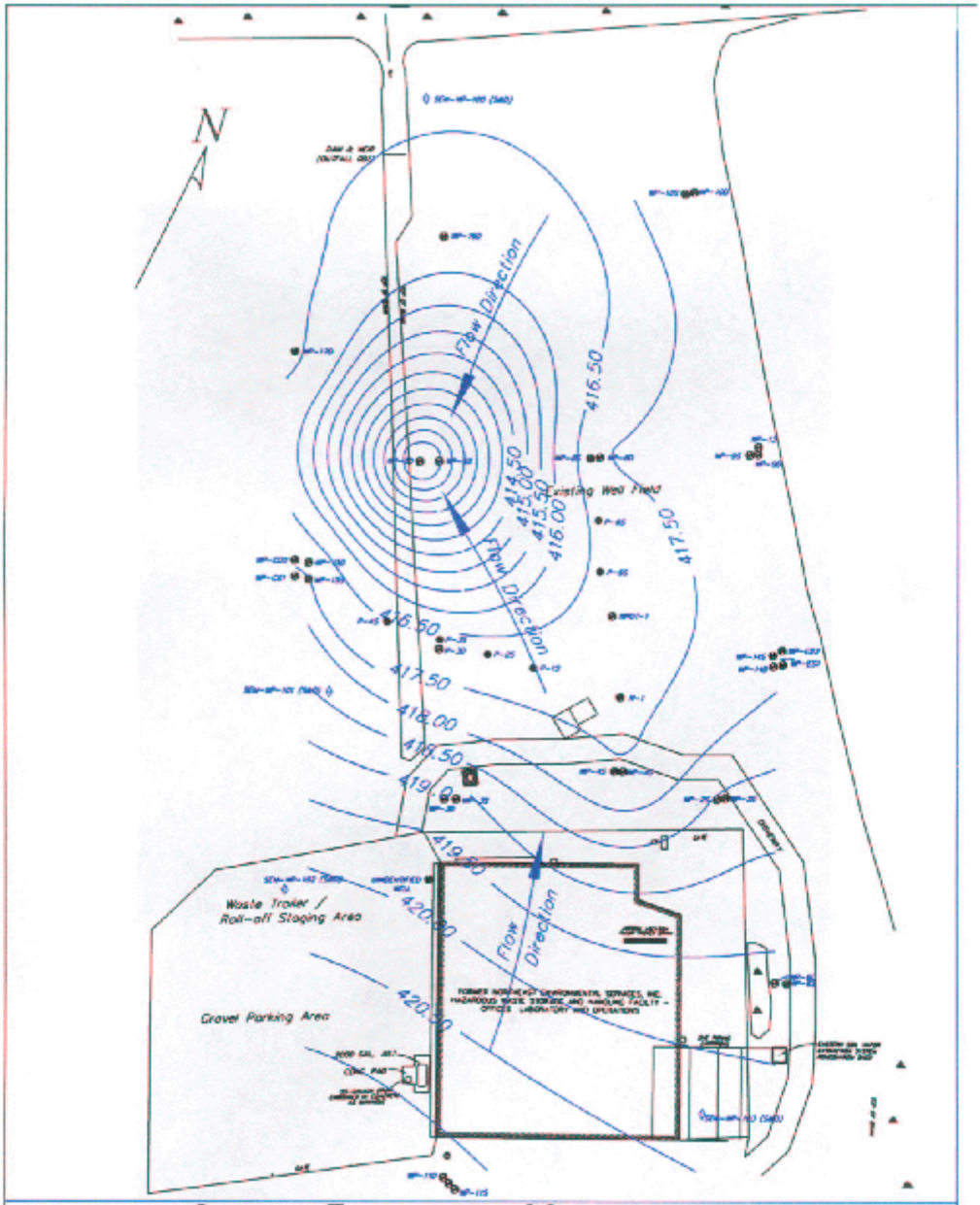
NYSDEC SPILL NO. 01-60024 / PIN NO. H-0529

SEM PROJ. NO. 3003.050.12.02
DATE: December 5, 2002
EDITED BY: CKP | File: NES-Shallow GW 10-28-02.dwg

FIGURE 3

SHALLOW TOTAL VOC CONCENTRATIONS (PPB)
October 1999



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CANAL ST. ROAD, CANASTOTA, NY
NYSDEC SPILL NO. 01-60024 / PIN NO. H-0529

SEM PROJ. NO. 3003.050.12.02

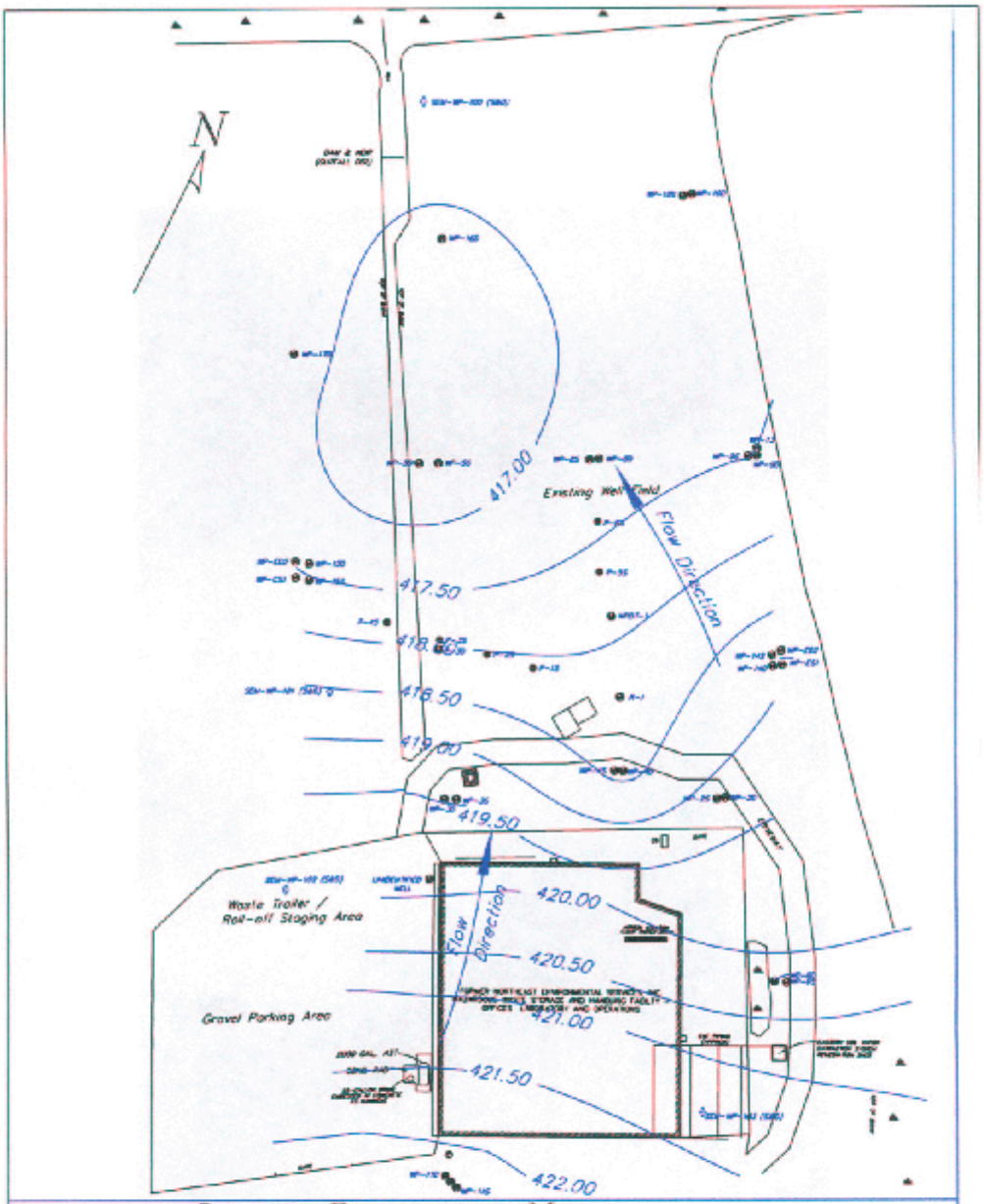
DATE: December 5, 2002

EDITED BY: CKP | File: NES-Deep GW 2-22-02.dwg

FIGURE 4

DEEP GROUNDWATER CONTOUR MAP

(FEBRUARY 2002)



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CANAL ST. ROAD, CANASTOTA, NY
NYSDEC SPILL NO. 01-60024 / PIN NO. H-0529

SEM PROJ. NO. 3003.050.12.02

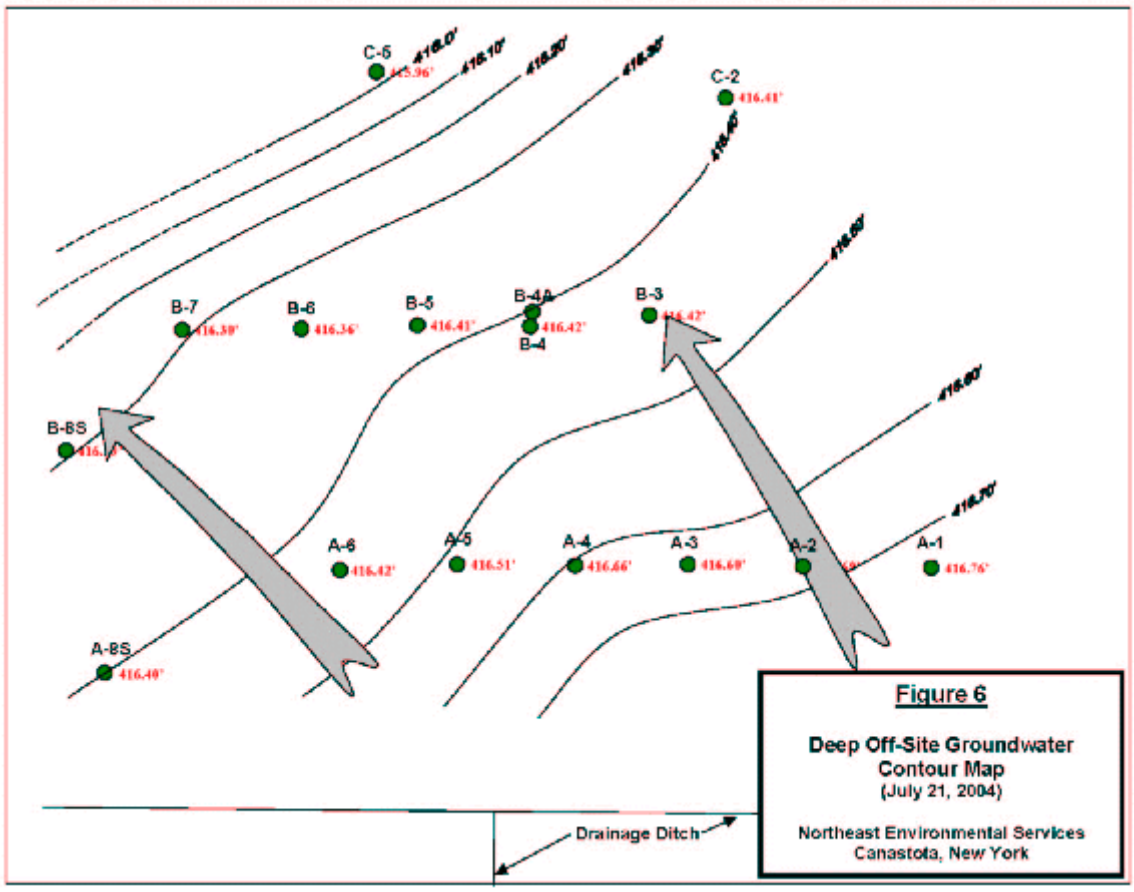
DATE: December 5, 2002

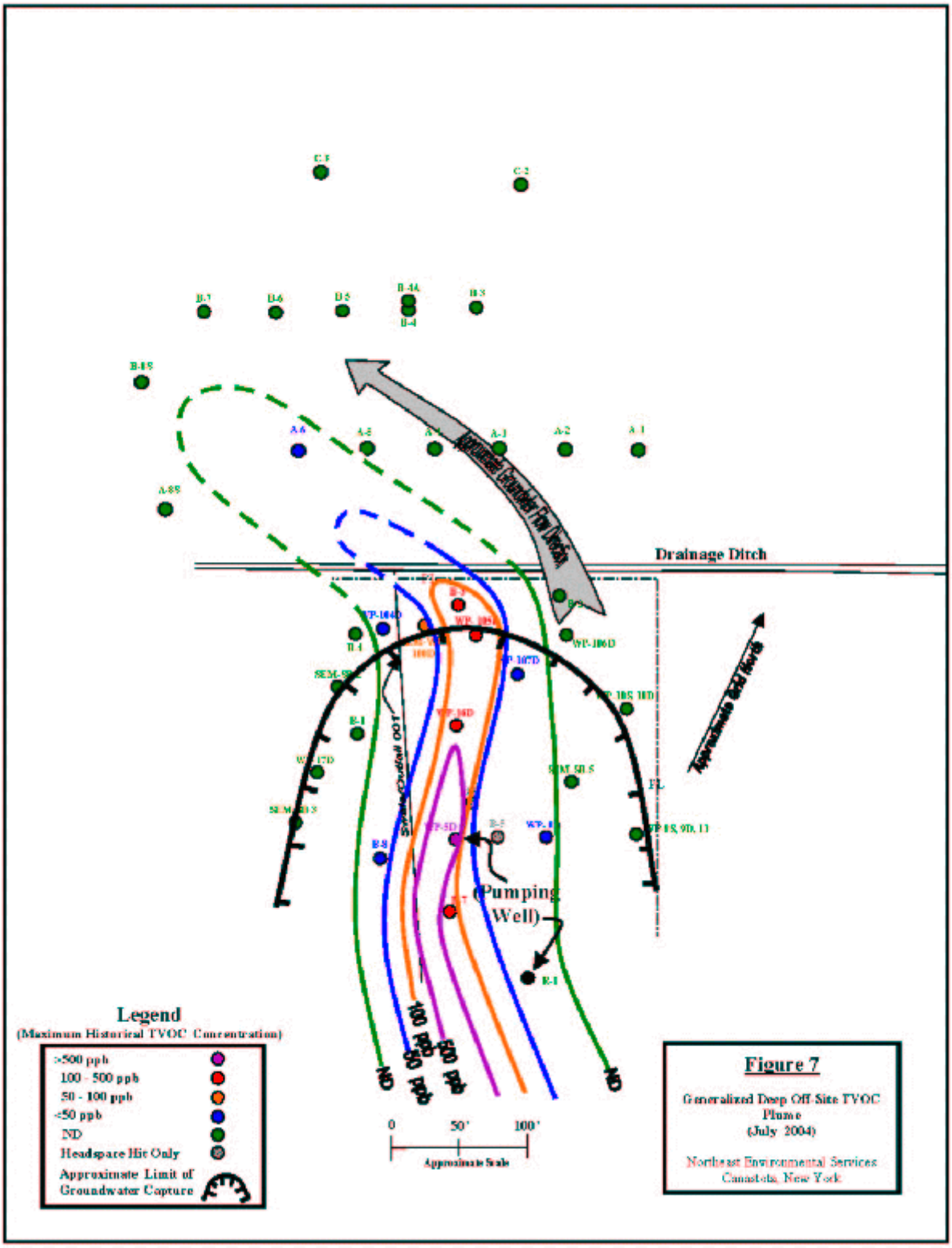
EDITED BY: CKP | File: NES-Deep GW 6-05-02.dwg

FIGURE 5

DEEP GROUNDWATER CONTOUR MAP

(JUNE 2002)


C-5
C-2
B-7
B-6
B-5
B-4A
B-4
B-3
B-8S
A-8S
A-6
A-5
A-4
A-3
A-2
A-1
Drainage Ditch
Figure 6
Deep Off-Site Groundwater Contour Map
(July 21, 2004)
Northeast Environmental Services
Canastota, New York


Drainage Ditch
(Pumping Well)
Legend
(Maximum Historical TVOC Concentration)
>500 ppb
100 - 500 ppb
50 - 100 ppb
<50 ppb
ND
Headspace Hit Only
Approximate Limit of Groundwater Capture
0
50'
100'
Approximate Scale
Figure 7
Generalized Deep Off-Site TVOC Plume
(July 2004)
Northeast Environmental Services
Canastota, New York

Attachment 1

Additional Facility and Environmental Information
(Excerpted from CA-725, 2003)

Facility and Release Sources

Northeast Environmental Services, Inc.(NES) was a commercial treatment and storage facility on Canal Road in the Town of Lenox, Madison County, New York, from September 5, 1986 until the facility was closed by order of the State Supreme Court on July 24, 2001, due to non-compliance with local fire and building codes. The NYSDEC revoked NES' operating permit in January, 2002. The facility is located outside of the Village of Canastota in the Town of Lenox, but has a Canastota mailing address (Figure 1). The facility is located in a rural area, surrounded by active farmland. The nearest residential dwelling is approximately 2,000 feet from the facility to the east, west and north. Dwellings to the south are a greater distance away, across the Erie Canal. There are no industrial or commercial buildings within the immediate vicinity of the facility.

NES, Inc. was a treatment and storage facility for hazardous and non-hazardous wastes. No wastes were disposed of on-site, and treatment and storage operations were completely contained within the building. Materials that are explosive, radioactive, or contained PCBs from a source that contained greater than or equal to 50 ppm PCBs were not accepted by NES, Inc. The facility's operation involved the processing, blending and preparation of hazardous and non-hazardous wastes for final disposal. Some examples of the hazardous wastes that were handled are industrial solvents, ink and paint resides, acids, caustics, lab chemicals and bleach. Examples of non-hazardous wastes are oil contaminated debris, latex paint, waxes and resins.

Prior to its purchase in September 1986, the facility was owned by the Haz-O-Waste Corporation. The Haz-O-Waste Corporation operated the site as a TSD facility for hazardous and industrial wastes. Hazardous waste management operations began at the facility on August 31, 1976.

NES, Inc. investigated two Solid Waste Management Units (SWMU) at the facility. The SWMUs were the truck unloading area and the outside storage area. Based upon the investigations, it determined that hazardous waste constituents have been released to the soil and groundwater beneath the facility. Samples of soil and groundwater have demonstrated contamination at levels exceeding state standards. The most significant contamination has been by volatile organic contaminants (VOCs), which are residual in the site soils (including those under the site structures) and have migrated to the north across the length of the facility via groundwater.

Geology

Based on the data from the many borings drilled at the site, the geologic materials in the upper 30 -35 feet across the site is generally composed of a reddish-brown to reddish-gray fine sand and silt. This unit becomes somewhat coarser and less silty with depth. Lenses of fine to medium sand, and occasionally gravel have been identified within the fine sand unit. These lenses appear to be interconnected to some degree, but are structurally complex, and have not been fully characterized.

Immediately underlying the upper fine sand and silt unit is a several foot thick layer of compact till. This till unit is composed of an unstratified and variable mixture of particle sizes, ranging from silt and clay to rounded - sub-angular gravels, and has been described as a basal till. The till layer represents a lower boundary to the upper sand aquifer, which is the primary aquifer of concern and appears to be continuous across the site. Due to concerns about penetrating this layer and possibly providing a conduit to lower aquifers, the thickness of the till layer has only been determined at two locations (one upgradient and one downgradient, but off-plume). Thickness at WP-12 was 2 feet min and has been estimated to be approximately 5 feet. Recoveries during drilling did not allow more precise measurement. Thickness at WP-13 was approximately 5 feet thick. Only one boring, located to the north of the site, did not encounter the till layer at an expected depth. It is not known if the till is absent or just deeper at this location.

Underlying the basal till layer is a second sand unit. Only a small number of borings have penetrated into this unit, so it has not been well characterized and its thickness is not known.

Borings have not been drilled to bedrock in the study area, so its depth is not known. However interpretations from other published information suggests that the depth to bedrock beneath the site is at least 40 - 60 feet.

Hydrogeology

Investigations performed at the site have identified two unconsolidated aquifers beneath the NES site. The upper 30-35 foot thick fine sand and silt unit is an unconfined water table aquifer. It is this unit that has been impacted by site contaminants and is presently the primary aquifer of concern. The depth to groundwater is between two (2) and four (4) feet below grade across the site, with groundwater flow (under non-pumping conditions) generally to the north-northwest. Groundwater flow rates have been calculated at around 100 feet per year for this unit, in general. Lenses of medium to coarse sands and occasionally gravels are present within this unit, generally increase in frequency and grain size with depth, and appear to be some somewhat interconnected. Consequently, these lenses are thought to be having an effect on groundwater flow and contaminant migration. Groundwater flow rates within interconnected coarser layers are not known, but can be expected to exceed the values calculated for the upper sand unit in bulk.

The second unconsolidated aquifer is a lower confined or semi-confined sand unit, which is physically and hydraulically separated from the upper sand unit by the intervening layer of basal till. The numerous borings drilled have shown the till unit to be at least several feet in thickness and to be continuous across the site. One boring north of the site did not encounter till at the expected depth, but it is not known whether this unit it is missing or just deeper at that location. Two piezometer sets have been installed that include piezometers screened in both the upper and lower sand units. Data from these piezometer sets have indicated an upward hydraulic gradient exists across the till unit. Due to the measured upward gradient and the density and continuity of the till layer, migration of site contaminants into the lower aquifer unit is not likely to occur beneath the site.

Topography

According to the USGS Topographic Map of Oneida, New York, the site is approximately 429 feet amsl. The topography of the site is generally flat with a slight slope to the north and a slight rise to the south of the site. Surface water runoff is generally from south to north across the site, via a series of buried drainage pipes that reportedly drain to a common shallow ditch that traverses the northern portion of the site. The shallow ditch drains in a general northerly direction and intersects a similar shallow ditch positioned in an east-to-west orientation along the northern edge of the subject property. The intercepting trench appears to drain in a westerly direction away from the site, in the general direction of Dutch Settlement Creek.

Groundwater

In order to contain and treat the contaminated groundwater, a groundwater extraction and treatment system was installed at the site in April 1993. The groundwater treatment system is designed to operate at a rate of up twenty (20) gallons per minute, initially pumping from one centrally located withdrawal well (WP-R1). The system was modified in April 1998, by the addition of a second withdrawal well (WP-5D), after data showed significantly increasing levels of vinyl chloride in a monitoring well near the physical limits of hydraulic containment from the initial withdrawal well. The vinyl chloride levels reached a high of several parts-per-million (ppm) in 1997, at which time this well was converted to a second pumping well. This well continues to be operated in concert with original recovery well. Piezometric monitoring data now show adequate plume capture on-site (Figure 2). The source of the vinyl chloride spike in monitoring well MW-5D has never been positively determined.

Two separate studies, including the most recent investigation, have shown concentrations of VOCs at a few hundred parts-per-billion (ppb) at the northern property line. After beginning pumping from MW-5D in 1998, VOC concentrations dropped off quickly in monitoring well MW-16D, which is located between MW-5D and the northern property line, indicating that a portion of the plume to the north of well MW-5D had been captured. Since that time, additional wells have been installed and sampled at the site, and the most recent data show that VOC concentrations

in the few hundred ppb range still exist at the northern property line. Considering all of the available data and the current hydrogeologic characterization, it is most reasonable to conclude that the high concentration vinyl chloride plume, impacting MW-5D, was quite narrow and possibly followed a preferential flow path(s) between the monitoring points in place at the time. The resultant shift in groundwater flow directions, from pumping of the original recovery well, may have caused the vinyl chloride plume to then move through MW-5D.

In this scenario, and based on all available groundwater quality data, there is a strong possibility that elevated levels of VOCs may have escaped from the site prior to attainment of the current level of hydraulic control. Such a plume would have had to be narrow, but most likely would have contained concentrations of vinyl chloride higher than those seen in well MW-5D, prior to its start of pumping. The significance of plume migration off-site has not been fully evaluated. A few groundwater samples were collected north of the site, which were found to be free of VOCs, however these sample locations may not have been of sufficient density to intercept the plume and the samples might not have been collected at all appropriate depths.

In summary, and after consideration of all available site data, it is reasonable to conclude that VOCs levels in excess of groundwater standards have migrated off-site in a generally northerly direction, within the upper fine sand aquifer. The extent the off-site migration and VOC concentrations are not known. Considering the site's long term release history and likely groundwater flow rates, contaminants could have migrated a considerable distance. Additional investigation are planned to better evaluate the conditions off-site.

The New York State Department of Health (NYSDOH) has periodically sampled private wells located in the downgradient direction from the site. The latest samples were taken in 1999 and no impacts from the site were detected. In the interim, and until additional off-site plume characterization can be completed, NYSDEC has recommended to the NYSDOH that the periodic monitoring of nearby private wells be done every three years unless additional data indicate a higher risk level. The distance to downgradient groundwater users, and expected natural dilution and attenuation of any fugitive plume, all act to reduce the likelihood of significant impact to existing private wells near the site. The nearest residential dwellings are approximately 2,000 feet side gradient and 3,000 feet downgradient of the facility.

Key Contaminants: 1,1,1-Trichloroethane, toluene, xylene, 4-methyl-2-pentanone (MIBK), 1,2-dichloroethene, chloroethane, vinyl chloride.

References:

Subsurface Soil and Groundwater Remedial Investigation Report for the Former Northeast Environmental Services, Inc. Site, Strategic Environmental Management, Inc., December 23, 2002.
1999 Annual/2000 First Quarter Groundwater Monitoring System Report Northeast Environmental Services, Inc.,MEI Environmental Group, Inc., July 2000.
RCRA Facility Investigation: Soil Northeast Environmental Services, Inc., INTEX, November 4, 1992.

Air (indoor)

Investigations have shown that hazardous waste constituents have been released to the soil and groundwater beneath the facility. Thus, there is a possibility that there may be some contaminants impacting the indoor air quality in the building located at the facility. The facility ceased operations in July 2001. There are no active process and/or administrative areas at the facility. The building at the facility is currently vacant. Even though there is a possibility that air quality inside the buildings is impacted by underlying contamination, absence of any potential receptors eliminates any concern regarding human exposure and its impact on human health.

It is reasonable to conclude that there is no off-site indoor air impacts from soil gas vapor intrusion. The nearest residential dwellings are approximately 2,000 feet side gradient and 3,000 feet downgradient of the facility. The New York State Department of Health (NYSDOH) has periodically sampled private wells located in the downgradient direction from the site and this testing shows that groundwater impact has not occurred, so there is no potential for adverse indoor air exposure (see groundwater above).

Surface Soil (e.g. < 2 ft.) and Subsurface Soil (e.g. > 2 feet)

Comparison of all available soils data to Recommended Soil Cleanup Objective values presented in TAGM 4046 *Determination of Soil Cleanup Objectives and Cleanup Levels* showed several parameters which exceeded the TAGM.

Many soil samples have been taken at the site to characterize the nature and extent of contamination. Figure 3 shows soil sample locations near the building from the Subsurface Soil and Groundwater Remedial Investigation Report, December, 2002. These samples were analyzed for volatile and semi-volatile organic, pesticides, polychlorinated biphenyls (PCBs) and metals. Based on the results from the investigations, the following table represents contaminants found in soils at the site. The soil contamination was found near (i.e. within 50 feet) or under the building at the site. The Complete list of contaminants and their concentrations can be found in *Subsurface Soil and Groundwater Remedial Investigation Report for the Former Northeast Environmental Services, Inc. Site*, December 23, 2002 and *RCRA Facility Investigation: Soil Northeast Environmental Services, Inc.*, November 4, 1992.

Chemicals of Concern in Soils:

Contaminant of Concern	Maximum Concentration (ppb)	TAGM value (ppb)
acetone	730,000	110
ethyl benzene	160,000	5500
toluene	950,000	1500
xylene	510,000	1,200
4-methyl-2-pentanone (MIBK)	8,000	1000