PROPOSED REMEDIAL ACTION PLAN

Lee Ave Railroad Area
State Superfund Project
Norwich, Chenango County
Site No. 709014
February 2017

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

A public comment period has been set from:

2/24/2017 to 3/26/2017

A public meeting is scheduled for the following date:

3/21/2017 at 6:30 PM

Public meeting location:

Norwich Fire Department
2nd Floor Conference Room
31 East Main Street
Norwich, New York

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/26/2017 to:

Gary Priscott
NYS Department of Environmental Conservation
Division of Environmental Remediation
1679 Route 11
Kirkwood, NY 13795
gary.priscott@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information by Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Lee Avenue Railroad Area site is a three acre parcel within the New York Susquehanna and Western (NYSW) railroad right-of-way (ROW) in the City of Norwich, Chenango County. The site is approximately 1,750 feet west of the Chenango River and less than 0.5 miles north of the city center. The site is adjacent to mixed industrial and residential properties on the east, residential properties on the west, and is bisected north-south by Rexford Avenue (State Route 23).

Site Features: The site is part of a railroad ROW. There is a single rail line aligned generally north-south through the site. Adjacent to the tracks the ground surface is a mix of railroad ballast, other unvegetated coarse fill type material, paved areas, and areas with vegetated cover.

Current Zoning and Land Use: The current zoning is industrial. The Chenango County Industrial Development Authority (CCIDA) is the current site owner of record. The railroad line at this site has been inactive since 2006; however, plans exist to rehabilitate the tracks for reuse.

Past Use of the Site: The rail line in this area dates to pre-1900. It appears that contamination at this site may have occurred through waste disposal actions associated with industrial operations that occurred at the former Lee Avenue Plant, which is adjacent to the northern portion of the site along the east side. The area between the former Lee Avenue Plant and the railroad tracks appears to have been used by operators at the Plant for disposal. Prior uses at the former Lee Avenue Plant that appear to have led to site contamination include manufacturing of electronics and aircraft engine parts.

Site assessments, environmental investigations, soil remediation and performance monitoring were all conducted for portions of this site by Hercules, Inc. between 1991 and 1997. A preliminary soil vapor intrusion evaluation was conducted by the Department in 2004. Environmental investigations were initially continued by the CCIDA through Department's Environmental Restoration Program (ERP) between 2005 and 2009. Investigations were continued by the Department through the State Superfund Program between 2010 and 2012. Currently, the remedial program is being conducted by Hercules, Inc. through an agreement with the Department.

Site Geology and Hydrogeology: The site is located on the western edge of the Chenango River Valley. This is partially evidenced by outcropping bedrock immediately west of the railroad tracks. Unconsolidated sediments overlying bedrock on-site range from a few inches to approximately 10 feet thick. The unconsolidated sediments on-site generally consist of silty sand with some gravel. The bedrock is comprised of low permeability shale and siltstone. The uppermost 2 to 5 feet of bedrock beneath the site appears to be highly weathered and fractured; beneath this weathered zone the bedrock is more competent with occasional vertical fractures. At the site, groundwater is encountered within the upper weathered and fractured zone. The general direction of groundwater flow is to the east.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives that restrict the use of the site to industrial use as described in Part 375-1.8(g) are being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

Hercules Incorporated (Hercules)

The Department and Hercules entered into a Consent Order (Index #R7-0787-12-06) on July 10, 2012. The Order obligates the responsible parties to implement a full remedial program.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- research of historical information;
- geophysical survey to determine the lateral extent of wastes;
- test pits, soil borings, and monitoring well installations;
- sampling of waste, surface and subsurface soils, groundwater, and soil vapor;
- sampling of surface water and sediment; and
- ecological and human health exposure assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

1,1-dichloroethane
1,1-dichloroethene
1,1,1-trichloroethane
cis-1,2-dichloroethene
tetrachloroethene (PCE)
toluene
trichloroethene (TCE)
trans-1,2-dichloroethene
vinyl chloride

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

IRM Soil Vapor Mitigation

Based on soil vapor intrusion sampling results, sub-slab depressurization systems (SSDSs) were installed by Hercules on 24 off-site buildings to mitigate the migration of vapors from

groundwater. As a result of investigations conducted prior to the RI, 45 off-site buildings had previously been mitigated through installation of SSDSs. Mitigation systems installed at all 69 buildings have been inspected and maintained by Hercules, pursuant to a Department approved SSDS interim inspection and maintenance work plan dated February 5, 2013.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

Nature and Extent of Contamination: Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), inorganics, polychlorinated biphenyls (PCBs), and pesticides. Based on investigations conducted to date, the primary contaminants of concern that are site related include VOCs in soil, groundwater, and soil vapor.

Soil – Subsurface soil in the area of disposal on-site has been impacted by VOCs that occur at levels above the soil cleanup objectives (SCOs) for unrestricted use and the protection of groundwater. VOCs that are above their respective SCOs include 1,1,1-trichloroethane (1,1,1-TCA), cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), and trichloroethene (TCE). Although these constituents are above soil cleanup objectives (SCOs) for unrestricted use and protection of groundwater they do not exceed the SCOs for industrial use. Additionally, VOCs do not exceed unrestricted SCOs in soil off-site.

Groundwater – Constituents with concentrations above their respective groundwater standard are limited to VOCs only and include 1,1,1-TCA, TCE and their associated breakdown products, as well as, PCE and toluene. Breakdown products for 1,1,1-TCA and TCE together include 1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-DCE, trans-1,2-dichloroethene, and vinyl chloride. VOCs in groundwater off-site with concentrations above groundwater standards primarily include cis-1,2-DCE and TCE. Contamination in groundwater has migrated from the disposal area to off-site locations. Groundwater contamination appears to extend approximately 3,500 feet from the site and in the general direction of groundwater flow to the east and southeast.

Soil Vapor – The primary contaminant of concern in the soil vapor is TCE. The presence of TCE in soil vapor corresponds to the detections of the contaminant in groundwater and they appear to occur in the same general area. No buildings exist on-site; therefore, no on-site soil vapor intrusion evaluation has been necessary. However, off-site vapor intrusion evaluations have been and continue to be conducted by Hercules as part of the overall remedial program. Based on results from previous sampling and from sampling conducted during the remedial investigation, 69 off-site buildings have been mitigated to prevent potential exposures associated with soil vapor intrusion. In addition to the 69 mitigated structures, results from sampling have

indicated monitoring or resampling should continue for 25 structures and no further actions are necessary for 72 structures.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. People will not come into contact with site-related soil and groundwater contamination unless they dig below the surface. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. There are no buildings on-site so inhalation of site contaminants in indoor air via vapor intrusion is not a current concern and future concerns are unlikely unless the site is redeveloped. An investigation of soil vapor intrusion is on-going at off-site structures with actions being taken as necessary to address exposures.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the Limited Excavation and In-situ Treatment of Bedrock Groundwater remedy.

The elements of the proposed remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program.

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- reducing direct and indirect greenhouse gases and other emissions;
- increasing energy efficiency and minimizing use of non-renewable energy;

• conserving and efficiently managing resources and materials;
• reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
• maximizing habitat value and creating habitat when possible;
• fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
• integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs) as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards. The excavation would not require disturbance of the existing rail line. Approximately 772 cubic yards of contaminated soil will be removed from the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the design grades at the site.

3. In-situ Treatment

In-situ treatment will be implemented to degrade the contaminants in bedrock groundwater. The treatment reagent to be injected into the fractured bedrock will be determined during remedial design and may require additional investigation, laboratory bench scale testing, and a pilot scale study. Commercially available in-situ treatment technologies that appear to be viable for the contaminant and hydrogeologic conditions include: Biostimulation, Bioaugmentation, Biogechemical Reductive Dechlorination (BiRD), and Colloidal Activated Carbon Biomatrix (PlumeStopTM). Conceptually, the lateral extent of treatment will be approximately 61,500 square feet (ft2) and the in-place treatment zone will be approximately 50,000 cubic yards (yd3). Specific injection plan details (e.g., number, locations, and depth of injection points) will be determined during remedial design.

4. Vapor Intrusion

Continued inspection and maintenance of the existing off-site sub-slab depressurization systems to prevent the migration of vapors into the buildings from groundwater.

Continue to completion, the soil vapor intrusion evaluation currently underway. The evaluation will include provisions for implementing actions recommended to address exposures related to soil vapor intrusion. Any off-site buildings impacted by the site will be required to have a sub-slab depressurization system, or a similar engineered system, to mitigate the migration of vapors into the building from groundwater.

5. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with part 375-1.8(h)(3);
- allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in remedial element 5 above.

Engineering Controls: The sub-slab depressurizations systems discussed in remedial element 4 above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site or off-site in the area of contamination, including provisions for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any new buildings developed on-site or for any new buildings developed off-site in the area of contamination, as may be required by the Institutional and Engineering Control Plan discussed above.

c. an Inspection and Maintenance (I&M) Plan to ensure continued inspection, maintenance, and reporting of any mechanical or physical components of the active vapor mitigation systems. The plan includes, but is not limited to:

- procedures for inspecting and maintaining the system(s); and
- compliance inspection of the systems to ensure proper operation and maintenance as well as providing the data for any necessary reporting.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into categories depending on what constituents were detected in each medium sampled. For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Groundwater

Groundwater samples were collected from bedrock using monitoring wells and groundwater samples were collected from overburden using temporary sampling points and monitoring wells. As detailed in the RI, earlier investigations of groundwater at the site have identified site related contaminants of concern to be limited to volatile organic compounds (VOCs). Specifically, previous groundwater sampling results indicated presence of trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), and their associated breakdown products. Groundwater sampling conducted for the RI focused on additional sampling of VOCs to further evaluate the nature and extent of these contaminants on- and off-site.

Due to the location of the site along the bedrock valley wall, the bedrock monitoring wells are located mostly on-site or near to the site boundaries. The overburden temporary sampling points and monitoring wells are mostly located off-site. As depicted in Tables 1A and 1B, the distinction between on-site and off-site is important for understanding the differences in groundwater contaminant conditions with regard to the changes in location and the hydrogeologic units in which groundwater exists (i.e., bedrock versus overburden).

Table 1A – Groundwater in Bedrock (depicts mostly conditions On-Site)

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
1,1-Dichloroethane	ND[c] – 1,500	5	7 of 19
1,1-Dichloroethene	ND – 350	5	6 of 19
1,1,1-Trichloroethane	ND – 1,100	5	5 of 19
Cis-1,2-Dichloroethene	ND – 16,000	5	8 of 19
Tetrachloroethene	ND – 270	5	3 of 19
Toluene	ND – 470	5	4 of 19
Trans-1,2-Dichloroethene	ND – 67	5	2 of 19
Trichloroethene	ND – 70,000	5	8 of 19

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Vinyl Chloride	ND – 420	2	6 of 19

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
c – ND: compound was not detected.

The primary contaminants of concern on-site include: TCE, 1,1,1-TCA and their associated breakdown products, as well as, trichloroethene (PCE), and toluene. Breakdown products of TCE detected at the site include cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene (1,1-DCE), tran-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride. Breakdown products of 1,1,1-TCA detected at the site include 1,1-dichloroethane, 1,1-DCE and vinyl chloride. As indicated, some breakdown products for TCE and 1,1,1-TCA are the same.

The primary contaminants of concern are associated with disposals of spent solvents in the area of the site between the railroad tracks and the former Lee Avenue Plant. The concentrations and distribution of the contaminants in groundwater are shown on Figure 2.

Detections of contaminants in groundwater on-site are localized to groundwater within the shallow fractured bedrock. Groundwater samples collected from below the shallow fractured bedrock zone do not show detections of contamination.

Contamination off-site, in areas hydraulically downgradient and generally to the east, are all within the overburden groundwater.

Table 1B – Groundwater in Overburden (depicts mostly conditions Off-Site)

Detected Constituents	Concentration Range Detected (ppb)	SCG (ppb)	Frequency Exceeding SCG
VOCs			
Cis-1,2-Dichloroethene	ND – 32	5	20 of 109
Tetrachloroethene	ND – 14	5	1 of 109
Trichloroethene	ND – 200	5	51 of 109

The primary contaminants of concern off-site are TCE and cis-1,2-DCE. These contaminants are also associated with disposals of spent solvents on-site. As indicated in Table 1B, detections of TCE occurs more frequently and it is more wide-spread within the overburden groundwater. Figure 3 shows the distribution of TCE within the investigation area. TCE has been detected in overburden groundwater monitoring wells located up to approximately 3,250 feet southeast of the site. Portions of the TCE contaminant plume in the overburden groundwater appear to extend to the Chenango River.

Two out-of-service public water supply wells located within 200 feet of the east bank of the Chenango River were sampled and have no detections of contaminants.

Due to poor or incomplete hydraulic connection, it does not appear that the contamination in the shallow fractured bedrock groundwater acts as a continued source of contamination to the overburden groundwater off-site. This conceptualization is supported by the distribution of TCE shown on Figure 3.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater in shallow fractured bedrock on-site and near the site boundaries, and groundwater in overburden off-site. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: TCE, 1,1,1-TCA and their breakdown products, as well as, PCE, and toluene.

Soil

Soil samples were collected at the site during the RI to assess human exposures to soil contamination and potential impacts to groundwater. Soil samples were collected through use of direct-push boring methods and were mostly from 0-6 inches below either vegetative cover, weathered pavement material, or the crushed stone used as railroad ballast. Thickness of soil overlying bedrock ranges from several inches to a few feet over much of the site area located north of Rexford Street. Soil thickness increases in the area south of Rexford Street and samples were collected down to 9.5 feet below ground surface (bgs). Sampling results indicate that VOCs, one semi-volatile organic constituent, and one inorganic constituent exceed the unrestricted use SCGs and the applicable restricted use SCGs. Table 2 summarizes exceedances of SCGs. Soil samples collected off-site as part of the RI were analyzed for VOCs only and ranged in depth from 0 to 11 feet bgs. Off-site sampling results indicate no exceedances of unrestricted use SCGs for VOCs.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
1,1,1-Trichloroethane	ND[e] – 1.8	0.68	2 of 6	0.68[d]	2 of 6
cis-1,2-Dichloroethene	ND – 0.57 J[f]	0.25	1 of 6	0.25[d]	1 of 6
Acetone	ND – 0.67 J	0.05	2 of 6	1,000	0 of 6
Methylene Chloride	ND – 0.67 J	0.05	2 of 6	1,000	0 of 6
m,p-Xylenes	ND – 0.28	0.26	1 of 6	1,000	0 of 6
Tetracholorethene	ND – 13	1.3	4 of 6	1.3[d]	4 of 6
Trichloroethene	ND – 50	0.47	4 of 6	0.47[d]	4 of 6
SVOCs					
Benzo(a)anthracene	0.5 – 3.6 J	1	4 of 5	11	0 of 5
Benzo(a)pyrene	0.56 – 2.8	1	4 of 5	1.1	4 of 5
Benzo(b)fluoranthene	ND – 4.4	1	4 of 5	11	0 of 5
Benzo(k)fluoranthene	1.1 - 3	0.8	5 of 5	110	0 of 5

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Chrysene	0.64 – 3.9 J	1	4 of 5	110	0 of 5
Dibenz(a,h)anthracene	0.099 J – 0.6 J	0.33	2 of 5	1.1	0 of 5
Indeno(1,2,3-cd)pyrene	0.32 J – 1.7	0.5	4 of 5	11	0 of 5
Inorganics					
Arsenic	7.2 – 41.8	13	2 of 5	16	2 of 5
Cadmium	1.4 – 20.7 J	2.5	2 of 5	60	0 of 5
Chromium	14.2 – 23.7 J	1	5 of 5	800	0 of 5
Copper	43.8 - 263	50	4 of 5	10,000	0 of 5
Lead	49.2 - 240	63	4 of 5	3,900	0 of 5
Mercury	0.098 – 0.93	0.18	2 of 5	5.7	0 of 5
Nickel	20.7 – 164 J	30	3 of 5	10,000	0 of 5
Silver	ND – 75.7 J	2	3 of 5	6,800	0 of 5
Zinc	93.1 - 410	109	4 of 5	10,000	0 of 5
Pesticides/PCBs					
4,4'-DDD	ND – 0.0056 J	0.0033	3 of 5	180	0 of 5
4,4'-DDE	ND – 0.018 J	0.0033	4 of 5	120	0 of 5
4,4'-DDT	0.0043 – 0.058 J	0.0033	5 of 5	94	0 of 5

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Industrial Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.
e – ND: compound was not detected.
f – J: reported value was obtained from a reading that was less than the quantification limit, but greater than the method detection limit.

The primary soil contaminants are VOCs associated with the former disposal of spent solvents on-site. VOCs including 1,1,1-TCA, cis-1,2-DCE, PCE, and TCE were detected at concentrations greater than both the unrestricted use and restricted use SCGs. Each of these constituents were detected in at least some of the investigation groundwater samples. Figure 4 shows a compilation of soil sampling conducted for the RI and sampling conducted by the Department prior to the start of work by Hercules. The soil results shown together provides a better definition for the distribution of VOCs in soil. Combined results indicate no exceedances of unrestricted use SCGs for VOCs on-site in the area south of Rexford Street and in off-site areas.

Benzo(a)pyrene was the only SVOC detected at concentrations greater than the unrestricted use and restricted use SCGs. Detections of benzo(a)pyrene occurred in soil samples collected adjacent to the railroad tracks, beneath

the railroad ballast, and are likely associated with railway use and SVOC migration from creosote-treated railway ties. Therefore, benzo(a)pyrene will not be considered a site specific contaminant of concern.

Arsenic was the only inorganic detected at concentrations greater than unrestricted use and restricted use SCGs. Detections of arsenic occurred in soil samples on the north and south side of Rexford Street along the railroad tracks and beneath railroad ballast. Although arsenic is naturally occurring the detections may also be attributed to construction materials used in the roadway or railway crossing. Therefore, arsenic will not be considered a site specific contaminant of concern.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are 1,1,1-TCA, cis-1,2-DCE, PCE, and TCE.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related groundwater contamination was evaluated by the sampling of sub-slab soil vapor under structures, and indoor air inside structures. Due to the presence of buildings in the impacted area off-site, a full suite of samples were collected to evaluate whether soil vapor intrusion was occurring.

As part of the RI, soil vapor intrusion sampling (i.e., collecting combined sample sets of sub-slab, indoor, and outdoor air) has been conducted at 56 off-site structures. The samples were collected to assess the potential for soil vapor intrusion. The results indicate detections of TCE in sub-slab vapor at some structures and in the indoor air at some structures. In sub-slab vapor and in indoor air, TCE has been detected at maximum concentrations of 110 and 1 $\mu g/m^3$, respectively. Detections of TCE in sub-slab and indoor air are consistent with detections of TCE in overburden groundwater off-site.

Based on the sampling results, mitigations systems (i.e., sub-slab depressurization systems) were installed at eight of the 56 structures. Prior to the start of soil vapor intrusion sampling for the RI, Hercules installed mitigation systems at 16 structures that had previously been sampled by the Department.

Soil vapor intrusion evaluations conducted with oversight by the Department prior to the RI resulted in the installation of mitigation systems at 45 structures. Therefore, since 2004, the total number of structures with mitigation systems in the off-site area is 69. Inspections of the previously installed mitigation systems has been conducted as part of the RI and all systems are included within an interim inspection and maintenance program implemented by Hercules.

Overall, soil vapor intrusion evaluations for the off-site area have included offers to sample at 252 properties. Of the 252 properties, 166 have been sampled. Unsampled properties include 67 where owners have been unresponsive to offers for sampling and 19 where owners have declined offers for sampling.

In addition to the 69 structures that have been mitigated, results from sampling have indicated monitoring or resampling should continue for 25 structures and no further actions are necessary for 72 structures. The soil vapor intrusion evaluation for structures within the off-site area is considered to be incomplete and will be continued by Hercules as part of the remedial program.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of soil vapor. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process are, TCE.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternatives 2, 3, and 4 include the following common elements.

Common Element 1 – Soil Vapor Intrusion Evaluation

Soil vapor intrusion evaluation will be continued to determine the limits of the area where soil vapor intrusion may be occurring and to provide monitoring, as necessary. Based on current soil vapor intrusion sampling results, the limits for where soil vapor intrusion may be occurring is not defined, particularly in areas to the southeast within the investigation area. Sampling will be offered to homes in this area and in other areas identified by the NYSDOH. New sampling may include approximately 40 buildings. Additionally, 20 building owners have declined previous offers for sampling, 67 building owners have been unresponsive to previous offers for sampling, and 27 buildings have had results that indicated monitoring is required. Sampling of buildings in the decline and unresponsive categories will be provided when requested by the building owner. Sampling of buildings in the monitor category will continue to be offered until a decision for mitigation or no further action is determined by the NYSDOH. Mitigation of buildings will be performed as required, based on soil vapor intrusion sampling results and pursuant to NYSDOH guidance. Overall, it is anticipated that the soil vapor intrusion evaluation work will continue for 5 years following remedy selection.

Present Worth: *$494,000*
Capital Cost: *$6,600*
Annual Costs: *$113,000*

Common Element 2 – Institutional Controls and Site Management Plan

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with part 375-1.8(h)(3);
- allow the use and development of the controlled property for industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls: The Environmental Easement detailed above.

   Engineering Controls: The sub-slab depressurizations systems installed on buildings off-site.

   This plan includes, but may not be limited to:
   - an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
   - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site or off-site in the area of contamination, including provisions for implementing actions recommended to address exposures related to soil vapor intrusion;
   - provisions for the management and inspection of the identified engineering controls;
   - maintaining site access controls and Department notification; and
   - the steps necessary for the periodic reviews and certification of the institutional and engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   - monitoring groundwater to assess the performance and effectiveness of the remedy;
   - a schedule of monitoring and frequency of submittals to the Department;
   - monitoring for vapor intrusion for any new buildings developed on-site or for any new buildings developed off-site in the area of contamination, as may be required by the Institutional and Engineering Control Plan discussed above.

c. an Inspection and Maintenance (I&M) Plan to ensure continued inspection, maintenance, and reporting of any mechanical or physical components of the active vapor mitigation systems. The plan includes, but is not limited to:
   - procedures for inspecting and maintaining the system(s); and
   - compliance inspection of the systems to ensure proper operation and maintenance as well as providing the data for any necessary reporting.

For cost estimates, it was considered that the monitoring of overburden groundwater would continue for five years and the inspection and maintenance of the mitigation systems would continue for 30 years. However, it is anticipated that the requirement for mitigation and the need for continued inspection and maintenance would be assessed 10 years after implementation of the proposed remedy.

Present Worth: *$872,000*
Capital Cost: *$39,600*
Annual Costs: *$54,200*

Alternative 2 – Limited Excavation and Monitored Natural Attenuation

For the limited excavation, the on-site soils with site-related contaminants of concern which exceed the protection of groundwater SCOs, as defined in 6 NYCRR Part 375-6.8, will be excavated and transported off-site for disposal. The excavation would not require disturbance of the existing rail line. Approximately 772 cubic yards of contaminated soil will be removed from the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the design grades at the site.

Bedrock groundwater contamination will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the natural processes breaking down the contamination. Reports of the attenuation will be provided at 5 years, and a contingency active remediation will be proposed if it appears that natural processes alone will not address the contamination.

Present Worth: *$274,000*
Capital Cost: *$190,000*
Annual Costs: *$84,300*

Alternative 3 – Limited Excavation and In-situ Treatment of Bedrock Groundwater

For the limited excavation, the on-site soils with site-related contaminants of concern which exceed the protection of groundwater SCOs, as defined in 6 NYCRR Part 375-6.8, will be excavated and transported off-site for disposal. The excavation would not require disturbance of the existing rail line. Approximately 772 cubic yards of contaminated soil will be removed from the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the design grades at the site.

In-situ treatment will be implemented to degrade the contaminants in bedrock groundwater. The treatment reagent to be injected into the fractured bedrock will be determined during remedial design and may require additional investigation, laboratory bench scale testing, and a pilot scale study. Commercially available in-situ treatment technologies that appear to be viable for the contaminant and hydrogeologic conditions include: Biostimulation, Bioaugmentation, Biogechemical Reductive Dechlorination (BiRD), and Colloidal Activated Carbon Biomatrix (PlumeStop^{TM}). Conceptually, the lateral extent of treatment will be approximately 61,500 square feet (ft^2) and the in-place treatment zone will be approximately 50,000 cubic yards (yd^3). Specific injection plan details (e.g., number, locations, and depth of injection points) will be determined during remedial design.

Present Worth: *$475,000*
Capital Cost: *$391,000*
Annual Costs: *$84,300*

Alternative 4 – Full Excavation and In-situ Treatment of Bedrock Groundwater

For the full excavation, all on-site soils which exceed unrestricted SCOs, as defined in 6 NYCRR Part 375-6.8, will be excavated and transported off-site for disposal. The full excavation will require removal and replacement of the rail line on-site, tree clearing and grubbing in areas west of the rail line, and monitoring well abandonment. Approximately 6,197 cubic yards of soil will be removed from the site. Clean fill meeting the requirements of 6

NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the design grades at the site.

In-situ treatment will be implemented to degrade the contaminants in bedrock groundwater. The treatment reagent to be injected into the fractured bedrock will be determined during remedial design and may require additional investigation, laboratory bench scale testing, and a pilot scale study. Commercially available in-situ treatment technologies that appear to be viable for the contaminant and hydrogeologic conditions include: Biostimulation, Bioaugmentation, Biogechemical Reductive Dechlorination (BiRD), and Colloidal Activated Carbon Biomatrix (PlumeStop^{TM}). Conceptually, the lateral extent of treatment will be approximately 61,500 square feet (ft^2) and the in-place treatment zone will be approximately 50,000 cubic yards (yd^3). Specific injection plan details (e.g., number, locations, and depth of injection points) will be determined during remedial design.

Present Worth: *$2,900,000*
Capital Cost: *$2,810,000*
Annual Costs: *$84,300*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Alternative 1 - No Action	0	0	0
Alternative 2 - Limited Excavation and Monitored Natural Attenuation	236,000	252,000	1,640,000
Alternative 3 - Limited Excavation and In-situ Treatment of Bedrock Groundwater	437,000	252,000	1,840,000
Alternative 4 - Full Excavation and In-situ Treatment of Bedrock Groundwater	2,860,000	252,000	4,270,000

Costs shown for Alternatives 2, 3, and 4 each include the costs for Comment Elements 1 and 2 as described in Exhibit B.

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3, Limited Excavation and In-situ Treatment of Bedrock Groundwater as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by removing areas of soil with site related contamination contributing to groundwater, treating bedrock groundwater to expedite degradation of contamination, and preventing exposure to remaining contamination through institutional and engineering controls. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 5.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The proposed remedy (Alternative 3 – Limited Excavation and In-situ Treatment of Bedrock Groundwater) satisfies this criterion by removing areas of soil contamination, which are sources or potential sources of groundwater contamination, and by preventing exposures to contamination through institutional and engineering controls, namely the environmental easement, Site Management Plan, and soil vapor mitigation systems.

Alternative 1 (No Further Action) does not provide any additional protection to public health and the environment, and will not be evaluated further.

Alternative 2 (Limited Excavation and Monitored Natural Attenuation) complies with this threshold criterion, but perhaps to a lesser degree or with a lower certainty than Alternative 3 due to the lack of active remediation of groundwater.

Alternative 4 (Full Excavation and In-situ Treatment of Bedrock Groundwater) meets this threshold criterion.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternative 3 complies with SCGs to the extent practicable. SCGs are achieved for soil through excavation. The soil removal and in-situ treatment of groundwater also create conditions necessary to restore groundwater quality to the extent practicable. Alternative 4 would achieve the SCGs to the same degree and certainty as Alternative 3. Alternative 2 is likely to comply with this criterion, but to a lesser degree or with lower certainty.

Because Alternatives 2, 3, and 4 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Alternatives 2, 3, and 4 all include excavation of contaminated soil which is a potential continued source of contamination to groundwater. The full excavation of soil exceeding unrestricted use SCOs included in Alternative 4 does go further by removing the need for property use restrictions. However, it should be noted that the site occupies a portion of a railroad right-of-way and this is the foreseeable future use.

The in-situ treatment of groundwater included in Alternatives 3 and 4 have a greater potential for degradation of bedrock groundwater contamination. Alternative 2 would likely require longer duration groundwater monitoring and may include a change to in-situ treatment as a contingency remedial action if monitored natural attenuation proves to be ineffective. Alternatives 2, 3, and 4 would likely require long-term groundwater use restrictions.

Alternatives 3 and 4 appear to be equivalent in the degree to which they will reduce the potential for soil vapor intrusion. With Alternative 2 there is less certainty for reducing the potential for soil vapor intrusion.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternative 3 and 4 provide the greatest reduction in site related contaminant toxicity, mobility and volume through soil removal and in-situ treatment of bedrock groundwater. However, Alternative 4 includes the removal of significantly greater soil volume with no apparent increased benefit to the reduction of toxicity, mobility or volume of waste as compared to Alternative 3. Alternative 2 provides less reduction of toxicity, mobility or volume of waste than Alternative 3 or 4 due to the lack of active groundwater remediation.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 2, 3, and 4 all share short-term adverse impacts related to the construction type activities required for implementation (e.g., increased noise and traffic, and potential for dust and runoff). However, Alternative 4 has greater short-term adverse impacts that include a larger area of ground disturbance, removal of trees and vegetation, and removal and restoration of the rail line on-site. Additionally, the implementation of Alternative 4 will require much more energy input and therefore results in greater greenhouse gas (GHG) emissions.

The estimated time to achieve the remediation goals is shortest with Alternative 3. Alternative 4 adds time to achieve the remediation goals due to additional construction and Alternative 2 is estimated to take the longest time due to the lack of active groundwater remediation.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to

monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternative 2 and 3 are favorable in that they are readily implementable. Alternative 4 has uncertainty in its implementability associated with the removal and reconstruction of the rail line on site, the additional ground disturbances with the railroad right-of-way, and removal of soil near essential utilities.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

Alternative 2 has the lowest estimated costs due to the lack of active groundwater remediation. Alternative 4 has the highest estimated costs due to the greater capital costs associated with greater volume of excavated soil and replacement with clean backfill, and the removal and replacement of the rail line on site. Alternative 3 has substantially less costs than Alternative 4, yet appears to provide equal protection, compliance, effectiveness, and reduction of contamination with less short-term adverse impacts.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The site is entirely with the railroad right-of-way and is considered industrial use. Alternatives 2, 3, and 4 are all suitable for this use designation. Alternatives 2 and 3 allow for non-site-related contaminants to remain in soil beneath the existing railroad ballast material; these conditions would be controllable with the implementation of a Site Management Plan. Alternative 4 would not require restrictions on the site land use; however, the implementation is likely infeasible and may be unnecessary due to the foreseeable future use as a railroad.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

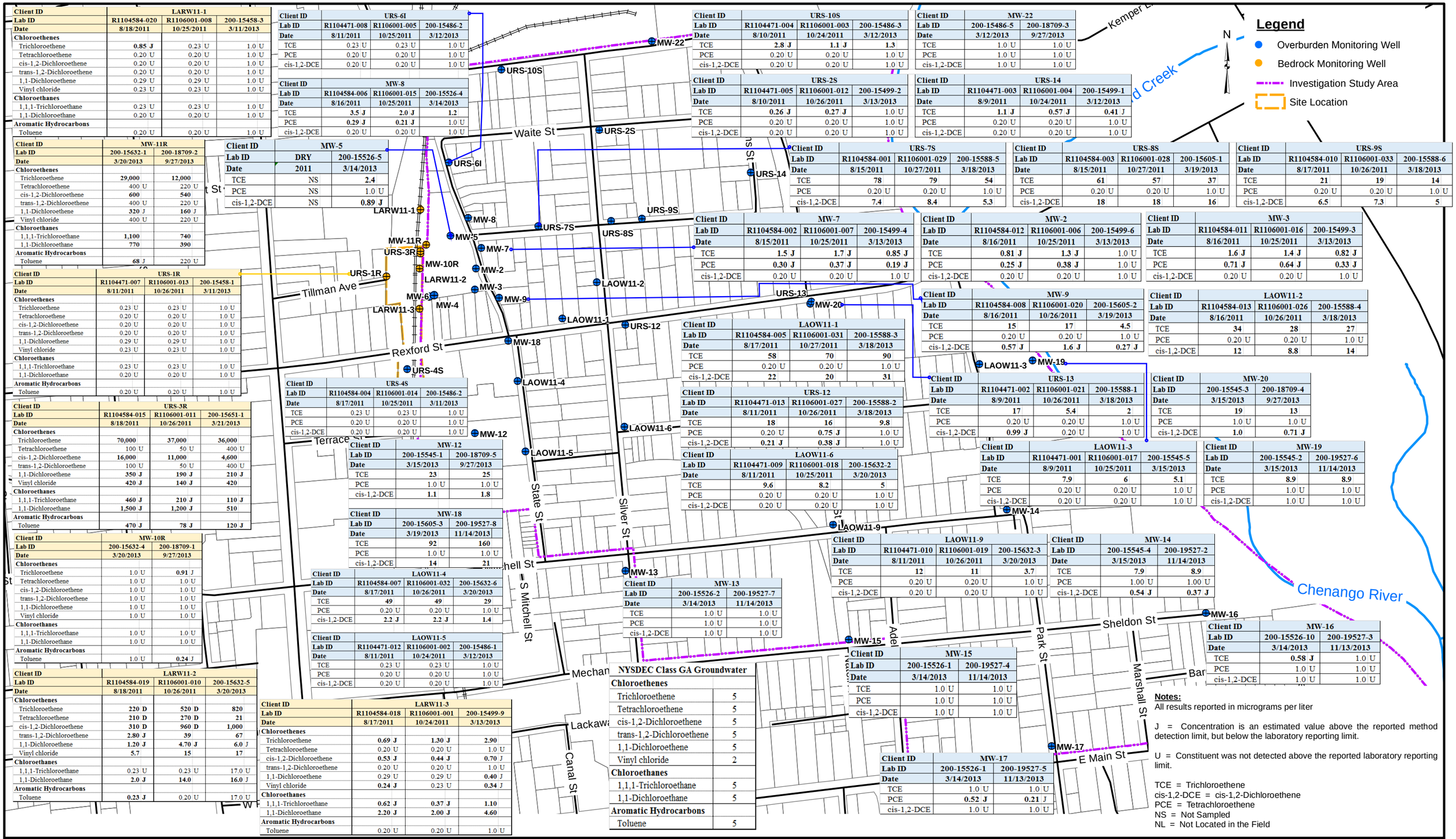
Alternative 3 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

EHS Support
consider it done

Dec. 2014

FIGURE 1
AERIAL SITE PLAN
LEE AVENUE RAILROAD AREA
NYS #709014
NORWICH, NEW YORK

Modified 01/2017 by GWP for use by the Department



Client ID	LARW11-1		
Lab ID	R1104584-020	R1106001-008	200-15458-3
Date	8/18/2011	10/25/2011	3/11/2013
Chloroethenes			
Trichloroethene	**0.85 J**	0.23 U	1.0 U
Tetrachloroethene	0.20 U	0.20 U	1.0 U
cis-1,2-Dichloroethene	0.20 U	0.20 U	1.0 U
trans-1,2-Dichloroethene	0.20 U	0.20 U	1.0 U
1,1-Dichloroethene	0.29 U	0.29 U	1.0 U
Vinyl chloride	0.23 U	0.23 U	1.0 U
Chloroethanes			
1,1,1-Trichloroethane	0.23 U	0.23 U	1.0 U
1,1-Dichloroethane	0.20 U	0.20 U	1.0 U
Aromatic Hydrocarbons			
Toluene	0.20 U	0.20 U	1.0 U

Client ID	URS-6I		
Lab ID	R1104471-008	R1106001-005	200-15486-2
Date	8/11/2011	10/25/2011	3/12/2013
TCE	0.23 U	0.23 U	1.0 U
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-8		
Lab ID	R1104584-006	R1106001-015	200-15526-4
Date	8/16/2011	10/25/2011	3/14/2013
TCE	**3.5 J**	**2.0 J**	**1.2**
PCE	**0.29 J**	**0.21 J**	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	URS-10S		
Lab ID	R1104471-004	R1106001-003	200-15486-3
Date	8/10/2011	10/24/2011	3/12/2013
TCE	**2.8 J**	**1.1 J**	**1.3**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-22		
Lab ID	200-15486-5	200-18709-3	
Date	3/12/2013	9/27/2013	
TCE	1.0 U	1.0 U	
PCE	1.0 U	1.0 U	
cis-1,2-DCE	1.0 U	1.0 U	

Client ID	URS-2S		
Lab ID	R1104471-005	R1106001-012	200-15499-2
Date	8/10/2011	10/26/2011	3/13/2013
TCE	**0.26 J**	**0.27 J**	1.0 U
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	URS-14		
Lab ID	R1104471-003	R1106001-004	200-15499-1
Date	8/9/2011	10/24/2011	3/12/2013
TCE	**1.1 J**	**0.57 J**	**0.41** J
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-11R		
Lab ID	200-15632-1	200-18709-2	
Date	3/20/2013	9/27/2013	
Chloroethenes			
Trichloroethene	**29,000**	**12,000**	
Tetrachloroethene	400 U	220 U	
cis-1,2-Dichloroethene	**600**	**540**	
trans-1,2-Dichloroethene	400 U	220 U	
1,1-Dichloroethene	**320** J	**160** J	
Vinyl chloride	400 U	220 U	
Chloroethanes			
1,1,1-Trichloroethane	**1,100**	**740**	
1,1-Dichloroethane	**770**	**390**	
Aromatic Hydrocarbons			
Toluene	**68** J	220 U	

Client ID	MW-5	
Lab ID	DRY	200-15526-5
Date	2011	3/14/2013
TCE	NS	**2.4**
PCE	NS	1.0 U
cis-1,2-DCE	NS	**0.89 J**

Client ID	URS-7S		
Lab ID	R1104584-001	R1106001-029	200-15588-5
Date	8/15/2011	10/27/2011	3/18/2013
TCE	**78**	**79**	**54**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**7.4**	**8.4**	**5.3**

Client ID	URS-8S		
Lab ID	R1104584-003	R1106001-028	200-15605-1
Date	8/15/2011	10/27/2011	3/19/2013
TCE	**61**	**57**	**37**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**18**	**18**	**16**

Client ID	URS-9S		
Lab ID	R1104584-010	R1106001-033	200-15588-6
Date	8/17/2011	10/26/2011	3/18/2013
TCE	**21**	**19**	**14**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**6.5**	**7.3**	**5**

Client ID	URS-1R		
Lab ID	R1104471-007	R1106001-013	200-15458-1
Date	8/11/2011	10/26/2011	3/11/2013
Chloroethenes			
Trichloroethene	0.23 U	0.23 U	1.0 U
Tetrachloroethene	0.20 U	0.20 U	1.0 U
cis-1,2-Dichloroethene	0.20 U	0.20 U	1.0 U
trans-1,2-Dichloroethene	0.20 U	0.20 U	1.0 U
1,1-Dichloroethene	0.29 U	0.29 U	1.0 U
Vinyl chloride	0.23 U	0.23 U	1.0 U
Chloroethanes			
1,1,1-Trichloroethane	0.23 U	0.23 U	1.0 U
1,1-Dichloroethane	0.20 U	0.20 U	1.0 U
Aromatic Hydrocarbons			
Toluene	0.20 U	0.20 U	1.0 U

Client ID	MW-7		
Lab ID	R1104584-002	R1106001-007	200-15499-4
Date	8/15/2011	10/25/2011	3/13/2013
TCE	**1.5 J**	**1.7 J**	**0.85 J**
PCE	**0.30 J**	**0.37 J**	**0.19 J**
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-2		
Lab ID	R1104584-012	R1106001-006	200-15499-6
Date	8/16/2011	10/25/2011	3/13/2013
TCE	**0.81 J**	**1.3 J**	1.0 U
PCE	**0.25 J**	**0.38 J**	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-3		
Lab ID	R1104584-011	R1106001-016	200-15499-3
Date	8/16/2011	10/25/2011	3/13/2013
TCE	**1.6 J**	**1.4 J**	**0.82 J**
PCE	**0.71 J**	**0.64 J**	**0.33 J**
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	URS-3R		
Lab ID	R1104584-015	R1106001-011	200-15651-1
Date	8/18/2011	10/26/2011	3/21/2013
Chloroethenes			
Trichloroethene	**70,000**	**37,000**	**36,000**
Tetrachloroethene	100 U	50 U	400 U
cis-1,2-Dichloroethene	**16,000**	**11,000**	**4,600**
trans-1,2-Dichloroethene	100 U	50 U	400 U
1,1-Dichloroethene	**350 J**	**190 J**	**210 J**
Vinyl chloride	**420 J**	**140 J**	**420**
Chloroethanes			
1,1,1-Trichloroethane	**460 J**	**210 J**	**110 J**
1,1-Dichloroethane	**1,500 J**	**1,200 J**	**510**
Aromatic Hydrocarbons			
Toluene	**470 J**	**78 J**	**120 J**

Client ID	URS-4S		
Lab ID	R1104584-004	R1106001-014	200-15486-2
Date	8/17/2011	10/25/2011	3/11/2013
TCE	0.23 U	0.23 U	1.0 U
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-12		
Lab ID	200-15545-1	200-18709-5	
Date	3/15/2013	9/27/2013	
TCE	**23**	**25**	
PCE	1.0 U	1.0 U	
cis-1,2-DCE	**1.1**	**1.8**	

Client ID	LAOW11-1		
Lab ID	R1104584-005	R1106001-031	200-15588-3
Date	8/17/2011	10/27/2011	3/18/2013
TCE	**58**	**70**	**90**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**22**	**20**	**31**

Client ID	LAOW11-2		
Lab ID	R1104584-013	R1106001-026	200-15588-4
Date	8/16/2011	10/26/2011	3/18/2013
TCE	**34**	**28**	**27**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**12**	**8.8**	**14**

Client ID	MW-9		
Lab ID	R1104584-008	R1106001-020	200-15605-2
Date	8/16/2011	10/26/2011	3/19/2013
TCE	**15**	**17**	**4.5**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**0.57 J**	**1.6 J**	**0.27 J**

Client ID	URS-12		
Lab ID	R1104471-013	R1106001-027	200-15588-2
Date	8/11/2011	10/26/2011	3/18/2013
TCE	**18**	**16**	**9.8**
PCE	0.20 U	**0.75 J**	1.0 U
cis-1,2-DCE	**0.21 J**	**0.38 J**	1.0 U

Client ID	URS-13		
Lab ID	R1104471-002	R1106001-021	200-15588-1
Date	8/9/2011	10/26/2011	3/18/2013
TCE	**17**	**5.4**	**2**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**0.99 J**	0.20 U	1.0 U

Client ID	MW-20		
Lab ID	200-15545-3	200-18709-4	
Date	3/15/2013	9/27/2013	
TCE	**19**	**13**	
PCE	1.0 U	1.0 U	
cis-1,2-DCE	**1.0**	**0.71 J**	

Client ID	LAOW11-6		
Lab ID	R1104471-009	R1106001-018	200-15632-2
Date	8/11/2011	10/25/2011	3/20/2013
TCE	**9.6**	**8.2**	**5**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	LAOW11-3		
Lab ID	R1104471-001	R1106001-017	200-15545-5
Date	8/9/2011	10/25/2011	3/15/2013
TCE	**7.9**	**6**	**5.1**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-19		
Lab ID	200-15545-2	200-19527-6	
Date	3/15/2013	11/14/2013	
TCE	**8.9**	**8.9**	
PCE	1.0 U	1.0 U	
cis-1,2-DCE	1.0 U	1.0 U	

Client ID	MW-18		
Lab ID	200-15605-3	200-19527-8	
Date	3/19/2013	11/14/2013	
TCE	**92**	**160**	
PCE	1.0 U	1.0 U	
cis-1,2-DCE	**14**	**21**	

Client ID	LAOW11-4		
Lab ID	R1104584-007	R1106001-032	200-15632-6
Date	8/17/2011	10/26/2011	3/20/2013
TCE	**49**	**49**	**29**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	**2.2 J**	**2.2 J**	**1.4**

Client ID	LAOW11-9		
Lab ID	R1104471-010	R1106001-019	200-15632-3
Date	8/11/2011	10/26/2011	3/20/2013
TCE	**12**	**11**	**3.7**
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-14		
Lab ID	200-15545-4	200-19527-2	
Date	3/15/2013	11/14/2013	
TCE	**7.9**	**8.9**	
PCE	1.00 U	1.00 U	
cis-1,2-DCE	**0.54 J**	**0.37 J**	

Client ID	MW-13		
Lab ID	200-15526-2	200-19527-7	
Date	3/14/2013	11/14/2013	
TCE	1.0 U	1.0 U	
PCE	1.0 U	1.0 U	
cis-1,2-DCE	1.0 U	1.0 U	

Client ID	LAOW11-5		
Lab ID	R1104471-012	R1106001-002	200-15486-1
Date	8/11/2011	10/24/2011	3/12/2013
TCE	0.23 U	0.23 U	1.0 U
PCE	0.20 U	0.20 U	1.0 U
cis-1,2-DCE	0.20 U	0.20 U	1.0 U

Client ID	MW-15	
Lab ID	200-15526-1	200-19527-4
Date	3/14/2013	11/14/2013
TCE	1.0 U	1.0 U
PCE	1.0 U	1.0 U
cis-1,2-DCE	1.0 U	1.0 U

Client ID	MW-16	
Lab ID	200-15526-10	200-19527-3
Date	3/14/2013	11/13/2013
TCE	**0.58 J**	1.0 U
PCE	1.0 U	1.0 U
cis-1,2-DCE	1.0 U	1.0 U

Client ID	MW-10R		
Lab ID	200-15632-4	200-18709-1	
Date	3/20/2013	9/27/2013	
Chloroethenes			
Trichloroethene	1.0 U	**0.91** J	
Tetrachloroethene	1.0 U	1.0 U	
cis-1,2-Dichloroethene	1.0 U	1.0 U	
trans-1,2-Dichloroethene	1.0 U	1.0 U	
1,1-Dichloroethene	1.0 U	1.0 U	
Vinyl chloride	1.0 U	1.0 U	
Chloroethanes			
1,1,1-Trichloroethane	1.0 U	1.0 U	
1,1-Dichloroethane	1.0 U	1.0 U	
Aromatic Hydrocarbons			
Toluene	1.0 U	**0.24** J	

Client ID	LARW11-2		
Lab ID	R1104584-019	R1106001-010	200-15632-5
Date	8/18/2011	10/26/2011	3/20/2013
Chloroethenes			
Trichloroethene	**220 D**	**520 D**	**820**
Tetrachloroethene	**210 D**	**270 D**	**21**
cis-1,2-Dichloroethene	**310 D**	**960 D**	**1,000**
trans-1,2-Dichloroethene	**2.80 J**	**39**	**67**
1,1-Dichloroethene	**1.20 J**	**4.70 J**	**6.0** J
Vinyl chloride	**5.7**	**15**	**17**
Chloroethanes			
1,1,1-Trichloroethane	0.23 U	0.23 U	17.0 U
1,1-Dichloroethane	**2.0 J**	**14.0**	**16.0** J
Aromatic Hydrocarbons			
Toluene	**0.23 J**	0.20 U	17.0 U

Client ID	LARW11-3		
Lab ID	R1104584-018	R1106001-001	200-15499-9
Date	8/17/2011	10/24/2011	3/13/2013
Chloroethenes			
Trichloroethene	**0.69 J**	**1.30 J**	**2.90**
Tetrachloroethene	0.20 U	0.20 U	1.0 U
cis-1,2-Dichloroethene	**0.53 J**	**0.44 J**	**0.70** J
trans-1,2-Dichloroethene	0.20 U	0.20 U	1.0 U
1,1-Dichloroethene	0.29 U	0.29 U	**0.40** J
Vinyl chloride	**0.24 J**	0.23 U	**0.34** J
Chloroethanes			
1,1,1-Trichloroethane	**0.62 J**	**0.37 J**	**1.10**
1,1-Dichloroethane	**2.20 J**	**2.00 J**	**4.60**
Aromatic Hydrocarbons			
Toluene	0.20 U	0.20 U	1.0 U

NYSDEC Class GA Groundwater	
Chloroethenes	
Trichloroethene	5
Tetrachloroethene	5
cis-1,2-Dichloroethene	5
trans-1,2-Dichloroethene	5
1,1-Dichloroethene	5
Vinyl chloride	2
Chloroethanes	
1,1,1-Trichloroethane	5
1,1-Dichloroethane	5
Aromatic Hydrocarbons	
Toluene	5

Notes:
All results reported in micrograms per liter

J = Concentration is an estimated value above the reported method detection limit, but below the laboratory reporting limit.

U = Constituent was not detected above the reported laboratory reporting limit.

TCE = Trichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
PCE = Tetrachloroethene
NS = Not Sampled
NL = Not Located in the Field

EHS Support *consider it done*

360 180 0 360
Scale In Feet

LEE AVENUE RAILROAD AREA
NORWICH, NEW YORK
NYS #709014

Drawn By: MDO	Plot: 11/2013
Review By: MSS	Plot: 11/2013
Scale: 1" = 360'	Plot: 11/2013

FIGURE 2
REMEDIAL INVESTIGATION MONITORING WELL LOCATIONS AND ANALYTICAL EXCEEDENCE MAP

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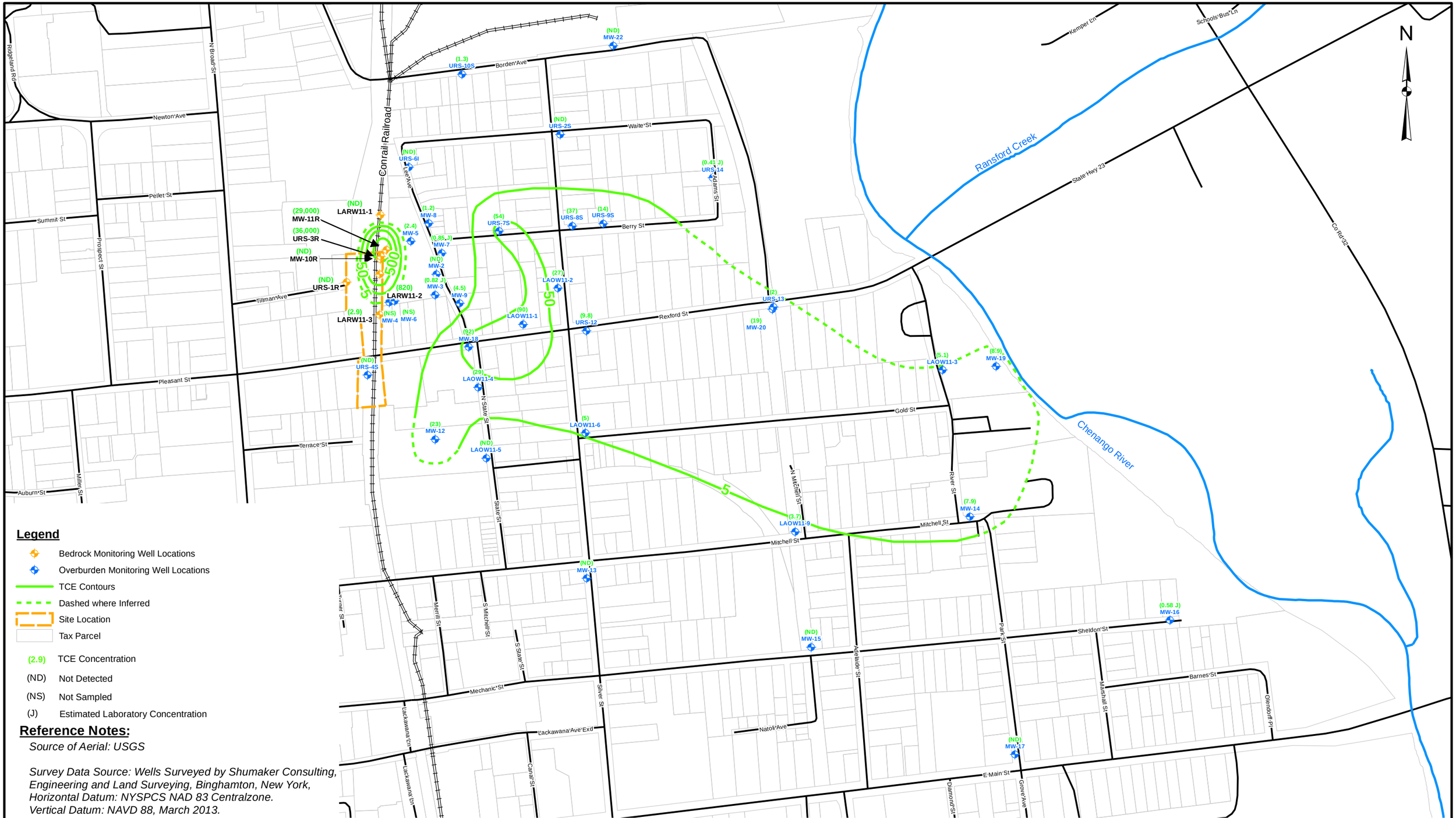


Legend

- Bedrock Monitoring Well Locations
- Overburden Monitoring Well Locations
- TCE Contours
- Dashed where Inferred
- Site Location
- Tax Parcel

(2.9) TCE Concentration
(ND) Not Detected
(NS) Not Sampled
(J) Estimated Laboratory Concentration

Reference Notes:

Source of Aerial: USGS

Survey Data Source: Wells Surveyed by Shumaker Consulting, Engineering and Land Surveying, Binghamton, New York, Horizontal Datum: NYSPCS NAD 83 Centralzone. Vertical Datum: NAVD 88, March 2013.

EHS Support consider it done

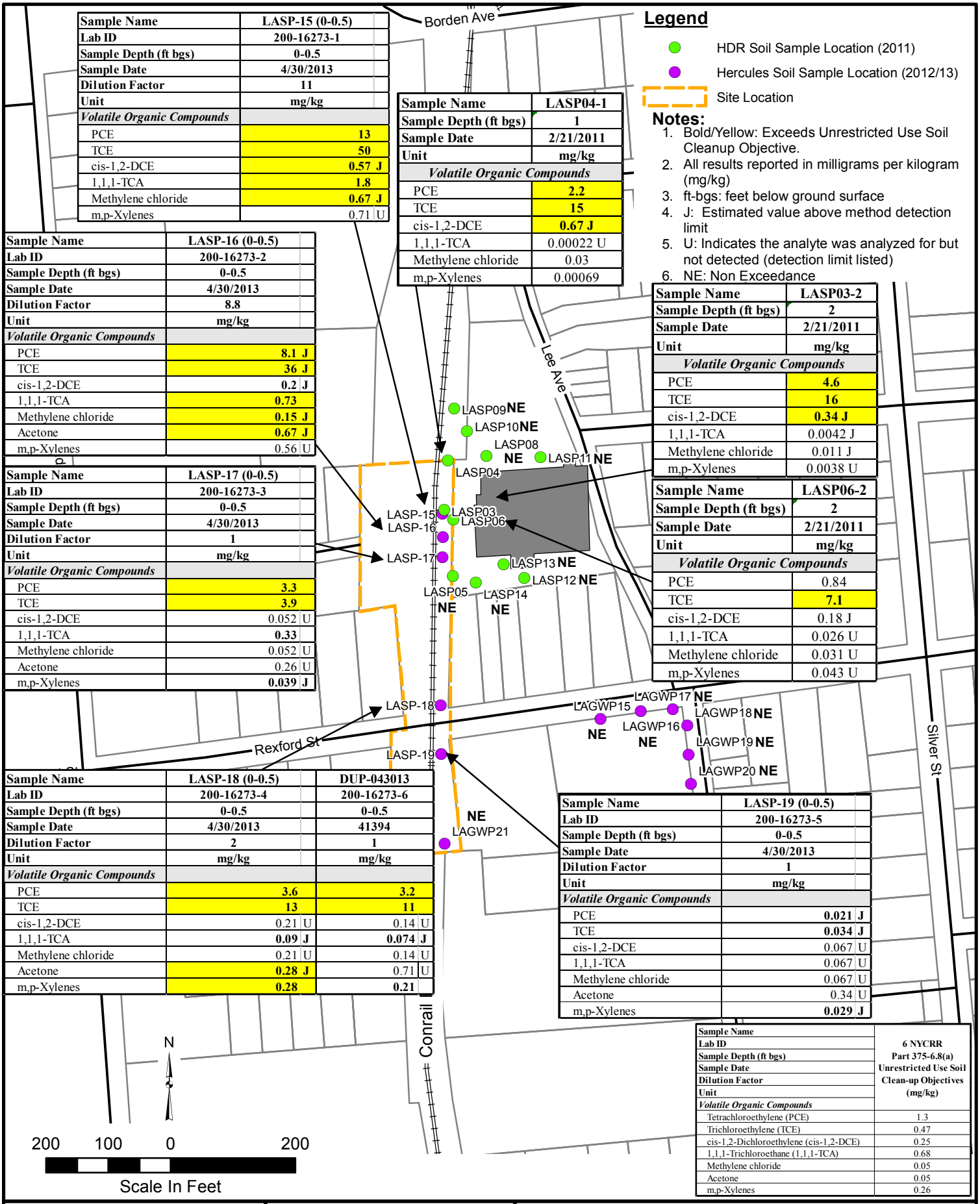
360 180 0 360
Scale In Feet

Lee Avenue Railroad Area
Norwich, New York
NYS #709014

FIGURE 3
TRICHLOROETHENE ISOCONCENTRATION MAP
MARCH 2013

Drawn By: MDO	Date: 09/2013
Review By: MSS	Date: 09/2013
Scale: 1" = 360'	Plot: 09/2013

Modified 01/2017 by GWP for use by the Department



Sample Name	LASP-15 (0-0.5)
Lab ID	200-16273-1
Sample Depth (ft bgs)	0-0.5
Sample Date	4/30/2013
Dilution Factor	11
Unit	mg/kg
Volatile Organic Compounds	
PCE	**13**
TCE	**50**
cis-1,2-DCE	**0.57 J**
1,1,1-TCA	**1.8**
Methylene chloride	**0.67 J**
m,p-Xylenes	0.71 U

Sample Name	LASP04-1
Sample Depth (ft bgs)	1
Sample Date	2/21/2011
Unit	mg/kg
Volatile Organic Compounds	
PCE	**2.2**
TCE	**15**
cis-1,2-DCE	**0.67 J**
1,1,1-TCA	0.00022 U
Methylene chloride	0.03
m,p-Xylenes	0.00069

Sample Name	LASP-16 (0-0.5)
Lab ID	200-16273-2
Sample Depth (ft bgs)	0-0.5
Sample Date	4/30/2013
Dilution Factor	8.8
Unit	mg/kg
Volatile Organic Compounds	
PCE	**8.1 J**
TCE	**36 J**
cis-1,2-DCE	**0.2 J**
1,1,1-TCA	**0.73**
Methylene chloride	**0.15 J**
Acetone	**0.67 J**
m,p-Xylenes	0.56 U

Sample Name	LASP03-2
Sample Depth (ft bgs)	2
Sample Date	2/21/2011
Unit	mg/kg
Volatile Organic Compounds	
PCE	**4.6**
TCE	**16**
cis-1,2-DCE	**0.34 J**
1,1,1-TCA	0.0042 J
Methylene chloride	0.011 J
m,p-Xylenes	0.0038 U

Sample Name	LASP-17 (0-0.5)
Lab ID	200-16273-3
Sample Depth (ft bgs)	0-0.5
Sample Date	4/30/2013
Dilution Factor	1
Unit	mg/kg
Volatile Organic Compounds	
PCE	**3.3**
TCE	**3.9**
cis-1,2-DCE	0.052 U
1,1,1-TCA	**0.33**
Methylene chloride	0.052 U
Acetone	0.26 U
m,p-Xylenes	**0.039 J**

Sample Name	LASP06-2
Sample Depth (ft bgs)	2
Sample Date	2/21/2011
Unit	mg/kg
Volatile Organic Compounds	
PCE	0.84
TCE	**7.1**
cis-1,2-DCE	0.18 J
1,1,1-TCA	0.026 U
Methylene chloride	0.031 U
m,p-Xylenes	0.043 U

Sample Name	LASP-18 (0-0.5)	DUP-043013
Lab ID	200-16273-4	200-16273-6
Sample Depth (ft bgs)	0-0.5	0-0.5
Sample Date	4/30/2013	41394
Dilution Factor	2	1
Unit	mg/kg	mg/kg
Volatile Organic Compounds		
PCE	**3.6**	**3.2**
TCE	**13**	**11**
cis-1,2-DCE	0.21 U	0.14 U
1,1,1-TCA	**0.09 J**	**0.074 J**
Methylene chloride	0.21 U	0.14 U
Acetone	**0.28 J**	0.71 U
m,p-Xylenes	**0.28**	**0.21**

Sample Name	LASP-19 (0-0.5)
Lab ID	200-16273-5
Sample Depth (ft bgs)	0-0.5
Sample Date	4/30/2013
Dilution Factor	1
Unit	mg/kg
Volatile Organic Compounds	
PCE	**0.021 J**
TCE	**0.034 J**
cis-1,2-DCE	0.067 U
1,1,1-TCA	0.067 U
Methylene chloride	0.067 U
Acetone	0.34 U
m,p-Xylenes	**0.029 J**

Legend

- HDR Soil Sample Location (2011)
- Hercules Soil Sample Location (2012/13)
- Site Location

Notes:

1. Bold/Yellow: Exceeds Unrestricted Use Soil Cleanup Objective.
2. All results reported in milligrams per kilogram (mg/kg)
3. ft-bgs: feet below ground surface
4. J: Estimated value above method detection limit
5. U: Indicates the analyte was analyzed for but not detected (detection limit listed)
6. NE: Non Exceedance

Sample Name	6 NYCRR Part 375-6.8(a) Unrestricted Use Soil Clean-up Objectives (mg/kg)
Lab ID	
Sample Depth (ft bgs)	
Sample Date	
Dilution Factor	
Unit	
Volatile Organic Compounds	
Tetrachloroethylene (PCE)	1.3
Trichloroethylene (TCE)	0.47
cis-1,2-Dichloroethylene (cis-1,2-DCE)	0.25
1,1,1-Trichloroethane (1,1,1-TCA)	0.68
Methylene chloride	0.05
Acetone	0.05
m,p-Xylenes	0.26

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Dec. 2014

Lee Avenue Railroad Area
Norwich, New York
NYS #709014

Figure 4
Unrestricted Use Soil Exceedance Map
Volatile Organic Compounds

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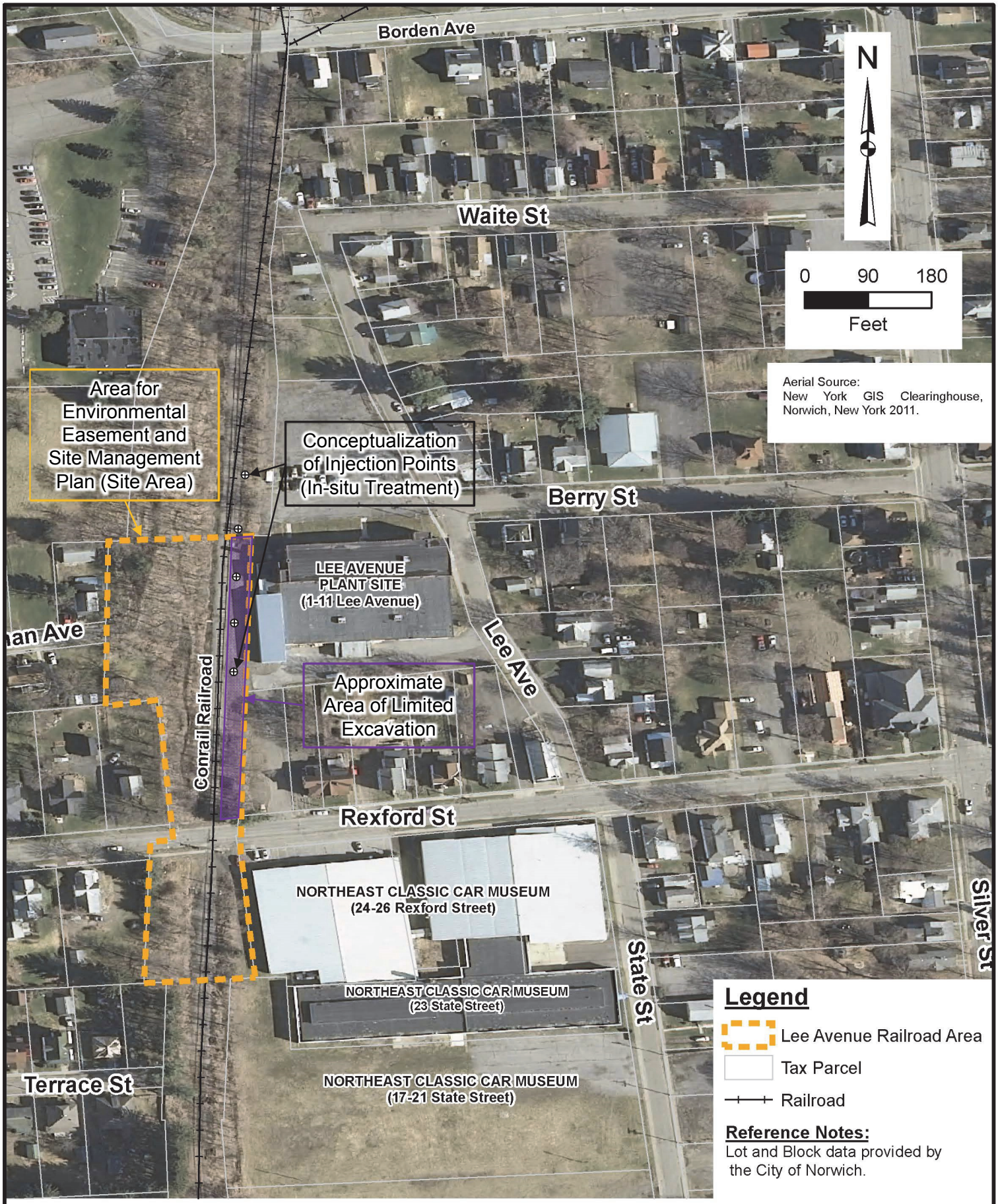

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Dec. 2014

FIGURE 5
PROPOSED REMEDY
LEE AVENUE RAILROAD AREA
NYS #709014
NORWICH, NEW YORK

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