Second Five-Year Review Report

for the

Liberty Industrial Finishing Superfund Site

Farmingdale

Town of Oyster Bay

Nassau County, New York

July 2017

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Region II
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Five-Year Review Report

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List of Abbreviations and Acronyms

AOC	Administrative Order on Consent
AWQS	Ambient Water Quality Standards
BHHRA	Baseline Human Health Risk Assessment
bgs	below ground surface
cis-1,2-DCE	cis-1,2-dichloroethene
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980 as Amended
CY	cubic yards
DER	Division of Environmental Remediation
DER-10	Technical Guidance for Site Investigation & Remediation
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
GAC	granulated activated carbon
GRS	Groundwater Remediation System
HI	Hazard Index
HQ	Hazard Quotient
IC	Institutional Control
MCLs	Maximum Contaminant Levels
mg/kg	milligrams per kilogram
mg/l	milligrams/liter
MSL	Mean Sea Level
µg/l	micrograms/liter
MNA	monitored natural attenuation
NOAEL	no-observed-adverse-effect level
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&F	Operational & Functional
O&M	Operation and Maintenance

OMMP	Operation, Maintenance, and Monitoring Plan
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PCOR	Preliminary Close-out Report
PPA	Prospective Purchaser Agreement
PRP	Potentially Responsible Party
RA	Remedial Action
RD/RA	Remedial Design/Remedial Action
RAB	Removal Action Branch
RAO	Remedial Action Objective
RAR	Remedial Action Report
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SCOs	Soil Cleanup Objectives
SEL	Severe Effect Level
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVI	Soil Vapor Intrusion
SVOCs	Semivolatile Organic Compounds
TAGM	NYSDEC Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leachate Procedure
TOB	Town of Oyster Bay
UST	Underground Storage Tank

Liberty Industrial Finishing Superfund Site
Farmingdale, New York
Second Five-Year Review Report

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment and is functioning as intended by the decision documents. The methods, findings, and conclusions of reviews are documented in the FYR. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

This is the second FYR for the Liberty Industrial Finishing Superfund site (Site), located in Farmingdale, Nassau County, New York. This FYR was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Lorenzo Thantu. This review was conducted pursuant to Section 121 (c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 et seq. and 40 CFR 300.430(f)(4)(ii), and in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the Site file.

The triggering action for this statutory review is the completion date of the previous FYR. A FYR is required at the Site due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site is addressed under one operable unit (OU) which is the subject of this FYR.

Site Background

The Site is located approximately one mile south of Bethpage State Park in Farmingdale, Town of Oyster Bay, Nassau County, New York. The Site includes a 30-acre property located at 55 Motor Avenue (see **Figure 1**). The property is bordered by the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east and a small town park, Ellsworth Allen Park, to the west. The surrounding area is primarily residential with several commercial establishments on the major roads.

The Site includes a former aircraft parts manufacturing and metal-finishing facility that began its operation in the early 1930's. From 1940 to 1944, the federal government and private corporate interests utilized the Site to develop and maintain production of materials needed for World War II. From 1944 through 1957, aircraft-related manufacturing activities predominated at the Site. Starting about 1957 through the 1980's, the facility operated as an industrial park and was used for various operations, including metal plating and finishing and fiberglass product manufacturing. Since the 1980's, the Site was used for light manufacturing and warehousing until these activities ceased in 2009.

The 30-acre Liberty Industrial Finishing site property consists of three tax parcels, 15-acre Western Parcel (Tax Lot 327), 7.5-acre Central Parcel (Tax Lot 331), and 7.5-acre Eastern Parcel (Tax Lot 332) (see **Figure 2**). The Town of Oyster Bay (TOB) acquired the 15-acre Western Parcel and 7.5-acre Central Parcel in September 2003 and July 2010, respectively, to expand adjacent Ellsworth Allen Recreational Park for future park development and construction. Site historical operations on the Western Parcel and Central Parcel have ceased and these parcels are presently vacant except for the groundwater treatment system on the southwestern portion of the Western Parcel. The Eastern Parcel has been redeveloped and is paved over with a large-scale grocery/retail store and adjacent parking lot that was completed in May 2010.

There are no private drinking wells in the vicinity of the Site. People living near the Site obtain their drinking water from local water utilities; the water utilities routinely test their supplies to ensure compliance with State and federal drinking water standards. In 1998, EPA and the Massapequa Water District (MWD) and the South Farmingdale Water District (SFWD) joined in a collaborative effort and installed six "sentinel" monitoring wells between the Site property and downgradient public drinking water wells (see **Figure 3)**. These sentinel wells serve as an early warning system to indicate whether any plume of contamination is beginning to migrate towards the water supply well fields. Periodic monitoring of these sentinel wells by the local water districts has not detected any Site-related contamination.

The Site was placed on the National Priorities List on June 10, 1986.

Table 1 summarizes the events from EPA's first response actions at the Site to this second FYR.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Liberty Industrial Finishing Superfund Site		
EPA ID: NYD000337295		
Region: 2	**State:** NY	**City/County:** Farmingdale/Nassau County

SITE STATUS	
NPL Status: Final	
Multiple OUs? No (Comprehensive Remedy)	**Has the Site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" was selected above, enter Agency name:** Click here to enter text.
Author name (Federal or State Project Manager): Lorenzo Thantu
Author affiliation: EPA/ERRD/NYRB/ENYRS
Review period: 06/04/2012 – 06/15/2017
Date of Site inspection: November 15, 2016
Type of review: Statutory
Review number: 2
Triggering action date: June 4, 2012
Due date *(five years after triggering action date)*: June 4, 2017

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Under an administrative order on consent, the potentially responsible parties (PRPs) completed a Supplemental Remedial Investigation (RI) in 2001. The Supplemental RI identified contamination on the facility property (evaluated as three separate parcels, eastern, central and western), nearby Massapequa Creek, and in two distinct plumes of groundwater (Plume A and Plume B) at the Site (a summary of the RI can be found in **Appendix D**). A risk assessment was conducted based upon the results of the RI.

For the western portion of the Site, in the Baseline Human Health Risk Assessment (BHHRA), the only receptor whose noncarcinogenic hazard exceeds EPA's benchmark value of a Hazard Index (HI) of 1 is the commercial/industrial worker, exposed to contaminants in the Upper Glacial groundwater and evaluated under a future use scenario, with an HI of 8.9. The primary contributors

to this HI are cadmium (Hazard Quotient (HQ) of 7.5) and chromium (HQ of 1.4). None of the cancer risks estimated for the western portion exceed EPA's target risk range. A subsequent BHHRA Addendum determined that there is an unacceptable noncancer risk to certain recreational users for incidental ingestion and dermal contact pathways as cadmium and hexavalent chromium as the primary contributors.

For the eastern portion of the Site the receptor whose cumulative risk exceeds one-in-a-million (1×10^{-6}) excess lifetime cancer risk is the future construction worker (1×10^{-3}), which is greater than the upper boundary of EPA's acceptable cancer risk range. For the future construction worker, the primary contributing medium and route is dermal exposure to aqueous waste, with benzo(a)pyrene and dibenzo(a,h)anthracene as the primary contributors to the cumulative risk. The only receptor whose cumulative noncancer hazard index (HI) exceeds 1.0 is the future construction worker with a HI of 31. The primary contributor to the HI is dermal exposure to aqueous wastes, with chromium and a polychlorinated biphenyls (PCB) (Aroclor 1260) being the primary contaminants of concern.

For the off-property residential areas, the receptors whose cumulative cancer risks exceed EPA's target cancer risk are current and future residents. The current off-property resident's cumulative cancer risk from ingestion of and inhalation of vapors from groundwater in the Upper Glacial aquifer is 1.9×10^{-3}, which is driven by vinyl chloride and 1,1-dichloroethene (1,1-DCE) (two degradation products of trichloroethylene (TCE)). The evaluation of noncarcinogenic effects shows that the HI for the off-Site child resident is 95 with cadmium, chromium, and manganese being the primary contaminants of concern. For the off-Site adult resident, the HI is 26 with cadmium, chromium, and manganese being the primary contaminants of concern. Under a future use scenario, the risks to the child and adult resident from ingestion of and inhalation of vapors from groundwater in the Magothy aquifer is 4.5×10^{-4}, with vinyl chloride and 1,1-DCE as the most significant contributors to the risk. The noncarcinogenic HI for the off-Site child resident using the Magothy groundwater is 6.8, with chromium and manganese as the primary chemicals of concern. The HI for the adult resident is less than EPA's acceptable level.

For the Massapequa Preserve, all carcinogenic risks estimated for surface water, sediment, and fish tissue are within EPA's acceptable risk range for all human populations. Noncarcinogenic HI values for surface water and fish tissue for all populations and for adults exposed to sediment are less than EPA's benchmark of an HI value of 1. The HI value for children exposed to sediment slightly exceeds the benchmark (HI of 1.1), although no HQ values for an individual chemical exceeds 1.

Several locations were identified as potential areas of concern for chromium. Dermal exposure to chromium may result in allergic responses in certain sensitive individuals, which is called "contact dermatitis." A no-observed-adverse-effect level (NOAEL) for chromium III contact dermatitis is approximately 4,300 milligrams/kilogram (mg/kg). The areas of concern, based on exceedance of the 4,300 mg/kg chromium III NOAEL, were the western portion surface samples in the northwest disposal area and the southern portion of the disposal basins (two samples exceeded 4,300 mg/kg); the western portion subsurface soil in and near the disposal basins, northwest disposal area and the ramp excavation pile on the Building N foundation (or former Building B Ramp Pile) (six samples exceeded 4,300 mg/kg); and the eastern portion subsurface soil in the Building B basement (one sample exceeded 4,300 mg/kg) (see **Figure 4**).

Based on the weight-of-evidence from the cumulative Massapequa Creek investigatory results from sediment toxicity analyses, fish tissue analyses, and macroinvertebrate analyses, it was concluded that only Pond A poses potential risks to ecological receptors that include benthic invertebrates and fish.

Response Actions

In 1978 and 1987, under administrative orders issued by NYSDEC, several of the PRPs at the Site removed contaminated soil and sludge from industrial waste disposal basins.

EPA conducted a Removal Site Evaluation at the Site during late 1993 and early 1994, and determined that electrical transformer areas contaminated with PCBs, wastes contained in underground storage tanks, and drums located at the Site posed an immediate risk to trespassers. At EPA's request, a number of PRPs agreed to remove these materials and transport them to appropriate facilities for treatment and disposal. This removal action, which eliminated significant current-use risks associated with the Site, was completed in April 1996.

On March 31, 1998, EPA issued an Action Memorandum selecting a non-time-critical removal action as an interim response action at the Site. The objective was to prevent contaminated groundwater from migrating beyond the boundary of the Liberty property, until the comprehensive soil and groundwater remedy could be implemented. This work was initially implemented starting in 1998 by PRPs pursuant to an EPA administrative order and has, since August 2004, been continued by the PRPs pursuant to a Consent Judgment. After design and testing, in January 2001 the PRPs constructed separate treatment systems to address both the organic and inorganic contamination in the groundwater. However, various operational problems initially prevented the interim groundwater treatment system from continuous operation and effective treatment of groundwater contamination. As a result, in January 2002, EPA directed the PRPs to begin the process of converting the on-property system for Plume A into a conventional pump and treat system. Since the conversion in June 2004, the existing on-property groundwater remediation system has been operating at its full design capacity in effectively treating both organic and inorganic contamination.

Additionally, pursuant to an EPA order issued per Section 16(a) of the Toxic Substances Control Act, in late 1999, the owners of the Liberty site removed approximately 1.5 million pounds of PCB-contaminated shredded auto-fluff that had been stored at the Site.

Remedy Selection

In 2002, EPA selected a remedy for the Site. The Record of Decision included the following remedial action objectives (RAOs):

On-Site Soils

- Prevent the direct exposure of receptors to Site-related contaminants through inhalation, direct contact or ingestion, or mitigate soil contaminant concentrations to a level that will not pose unacceptable risks to human health and the environment.
- Reduce the concentration or mobility of soil contaminants to a level which will prevent further degradation of groundwater.
- Remove all RCRA hazardous waste from the Site.
- Remove any structural impediments that might interfere with pre-design sampling and implementation of soil, subsurface feature, and groundwater remediation.

On-Site Subsurface Features (on Eastern Portion of the Site) and Underground Storage Tanks

- Removal of contaminated aqueous and/or solid materials from subsurface features and underground storage tanks.

On-Site and Off-Site Groundwater

- Prevent or minimize ingestion, dermal contact and inhalation of inorganic- and organic-contaminated groundwater that are above State and Federal maximum contaminant levels (MCLs).
- Restore groundwater quality to levels which meet State and Federal MCLs.

Massapequa Creek Pond A Sediments

- Prevent adverse effects to ecological receptors within the Massapequa Creek and associated ponds caused by exposure to Site-related contaminants.

In order to achieve these RAOs, EPA selected the following remedial action components as described in the 2002 ROD:

On-Site Soils

- Excavation and off-Site disposal of all soils contaminated above groundwater protection levels, estimated at 73,100 cubic yards (CY).
- Institutional Control (ICs) to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses.

On-Site Subsurface Features (on Eastern Portion of the Site) and Underground Storage Tanks

- Removal of contaminated aqueous and/or solid materials from underground storage tanks and other subsurface features (structures).

On-Site and Off-Site Groundwater

- Continued operation of the ongoing interim groundwater treatment system that is being converted to a conventional pump-and-treat system to address the groundwater underlying the Site property contaminated by previous operations at the Site.
- Continuation of the interim groundwater action by construction and operation of a conventional pump-and-treat system to address groundwater underlying the Site property which is believed to have been contaminated by an upgradient source.
- Construction and operation of a conventional pump-and-treat system to treat off-property groundwater contamination.
- Implementation of a groundwater monitoring program.
- ICs to prohibit installation or use of groundwater wells for human consumption until the aquifer is restored.

Massapequa Creek Pond A Sediments

- Excavation and off-Site disposal of approximately 2,600 CY of contaminated sediments within Pond A of the Massapequa Preserve.
- Implementation of a monitoring program for the remainder of the ponds within the Massapequa Preserve.

In September 27, 2012, EPA issued an Amendment to the 2002 ROD to implement a No Further Action/Natural Attenuation remedy for the on-property Plume B extraction and treatment system component and to give NYSDEC the lead agency role to address Plume B, including any Plume B remediation, as part of its response action at the Farmingdale Plaza Cleaners site (see **Figure 5**). In addition, in July 2012, EPA published an Explanation of Significant Differences (ESD) as part

of the Post-Decision Proposed Plan (PDPP) for the September 27, 2012 ROD Amendment to announce that the land use change from commercial/industrial to recreational for the Central Parcel would be protective.

The following Site-specific soil performance standards were selected in the 2002 ROD:

- 10 mg/kg for cadmium,
- 143 mg/kg for chromium,
- 0.7 mg/kg for TCE,
- 0.25 mg/kg for cis-1,2-DCE,
- 1.4 mg/kg for perchloroethylene (PCE),
- 0.29 mg/kg for Benzo(a)pyrene,
- 0.29 mg/kg for Dibenz(a,h)anthracene,
- 35 mg/kg for Cyanide,
- 1 mg/kg for PCBs between 0 and 1-foot below ground surface, and
- 10 mg/kg for PCBs 1-foot or more below ground surface.

The following Site-specific sediment performance standards were selected for the Massapequa Creek Pond A Sediments in the 2002 ROD:

- 50 mg/kg for cadmium, and
- 260 mg/kg for chromium.

Status of OU 1 Implementation

The remedial activities were undertaken in accordance with the September 30, 2003 Remedial Design/Remedial Action (RD/RA) Consent Judgment, and attached Statement of Work thereto, that was entered in the United States District Court for the Eastern District of New York on August 27, 2004. Several of the USTs and subsurface features were also addressed and removed in accordance with a March 21, 2002 Administrative Order on Consent (AOC) for Removal Action for Phase I Demolition Area. **Figure 6**, Phase I Demolition Area/Stop & Shop Parcel and Subsurface Features Location Map, shows locations of subsurface features on the Western Parcel (Lot 327) and Central Parcel (Lot 331) that were remediated per the March 21, 2002 AOC.

On-Site Soils (Remedial Work Element I) and Subsurface Features and Underground Storage Tanks (Remedial Work Element II)

The remedial activities for on-Site soils and subsurface features and underground storage tanks were initiated in March 2007 and were completed in May 2011. Based on the total waste volume disposal log, 57,967 tons of non-hazardous soils, 24,897 tons of hazardous soils, 436 tons of construction and demolition materials, 2,098 tons of mixed soil and debris, 880 CY of wood chips, 15.8 tons of scrap metal, 17,704 gallons of oil, 177 tons of asphalt, and 5,899 tons of concrete were removed from the Site in the performance of Remedial Work Elements I and II. A total of 125 subsurface features and 15 USTs were remediated and removed pursuant to the September 30, 2003 RD/RA Consent Judgment and the March 21, 2002 AOC, in the performance of Remedial Work Element II.

On-Site and Off-Site Groundwater (Remedial Work Element III)

Construction activities for Remedial Element III were performed at the Site property, as well as at off-property locations, including the Massapequa Preserve, various TOB and Nassau County rights-of-way (ROWs) and the Woodward Parkway Elementary School located at 95 Woodward Parkway in Farmingdale (see **Figure 7**). **Table 2** provides a chronological summary of major events for the Groundwater Remediation System (GRS) upgrades for Remedial Work Element III.

The on-property GRS extracts water from the Upper Glacial Aquifer (UGA). The off-property GRS includes recovery wells screened in both the UGA and Magothy Aquifer (MA), with the deepest Magothy well set to approximately 185 feet below grade, which is shallower than public water supply wells within the TOB. The GRS operates on a continuous basis, 24 hours per day. **Table 3** provides the design flow rate, as modified by pulse pumping that was initiated during this FYR period in March 2012, and discussed below, for each on and off-property recovery well. Extracted groundwater is piped from either on- or off-property recovery well locations into the on-property GRS building where it is processed first through a filtration unit (5 to 10 microns) and then through a pair of granulated activated carbon vessels prior to discharge as treated effluent.

Discharge permits exist for both sewer discharge (350 gpm) and State Pollutant Discharge Elimination System (SPDES) discharge (100 gpm) through an on-Site ground water infiltration gallery. Magothy recovery wells (RW-8, RW-9, and RW-10) primarily discharge to the on-property infiltration gallery. The remaining recovery wells (all Upper Glacial recovery wells) discharge primarily to the sewer system. A portion of the Upper Glacial flow from wells RW-4, RW-5, and RW-6 (also called mid-field wells) is blended into the infiltration gallery discharge in order to maximize treated groundwater discharge to the gallery, while still meeting permitted discharge limitations. Overall, from October 2002 through December 2016, the GRS extracted a total volume of 1,115 million gallons (Mgal).

Based on EPA and NSYDEC's review of the September 2010 Groundwater Remedial Action Report, a determination was made that the on-property and off-property pump and treat system is operational and functional, consistent with EPA's May 2011 Close Out Procedures for National Priorities List Sites (OSWER Directive 9320.2-22).

Massapequa Creek Pond A Sediments (Remedial Work Element IV)

The remedial activities for Pond A sediments were initiated in September 2007 and were completed in March 2009. **Table 4** provides a chronological summary of major pond sediments remedial action construction events for Remedial Work Element IV. A total of approximately 4,200 CY, or the equivalent of approximately 5,000 tons, of impacted sediment was excavated as determined by pre- and post-excavation surveys of the Site. The excavated sediments were transported to, and disposed of at, EPA-approved disposal facilities.

The remedy for Pond A sediments has been fully implemented, including the enhanced monitoring for the five lower ponds downstream of Pond A (required by the 2002 ROD and also as a recommendation/follow-up action in the first FYR Report). This component of the remedy consisted of surface water and sediment sampling and bioassays. The results of the enhanced monitoring program further supported the Agency's determination that only Pond A required remediation, and demonstrates that, over time, removal of the contaminant source in Pond A will have a beneficial effect on downstream pond sediment quality.

Vapor Intrusion Investigation

In addition, in February and early March 2006, EPA conducted a Phase I vapor intrusion investigation, which involved the collection of air samples at 15 homes in the vicinity of the Site, and at the Woodward Parkway Elementary School in Farmingdale, New York, in order to determine if vapors associated with groundwater contamination at the Site were entering those properties. In April 2006, EPA conducted follow-up sampling of indoor air at two of the homes and at the school. The sampling results did not show any vapor intrusion impact and, therefore, did not indicate any potential impact on the health of the occupants. From 2006 to 2010, EPA conducted vapor sampling at the Woodward Parkway elementary school and several homes, and the sampling results during this period did not show any vapor intrusion impact. Based on these results, in 2010 to 2014, EPA continued to conduct vapor sampling only at the Woodward Parkway

elementary school; the sampling results during this period also did not show any vapor intrusion impact as they were below screening levels in sub-slab soils and indoor air. A decision was made by EPA, with concurrence from NYSDEC and NYSDOH, to discontinue annual vapor sampling at the Woodward Parkway Elementary School, with an exception to conduct vapor sampling at the School during the Winter heating season before the second FYR is conducted.

Institutional Controls

The Liberty site property is comprised of three contiguous Tax Lots in Section 48, Block 518 of the Nassau County, New York Land and Tax Map. These Tax Lots, also called the Western, Central and Eastern Parcels, are from west to east: i) Tax Lot 327 being an approximately 15-acre parcel owned by the TOB; ii) Tax Lot 331 being an approximately 7.5-acre parcel owned by the TOB; and iii) Tax Lot 332 being an approximately 7.5-acre parcel owned by 55 Motor Avenue Co., LLC and leased to The Stop & Shop Supermarket Company for commercial use as a shopping center under a long term ground lease. Tax Lot 327 was acquired by the TOB in September 2003 to expand the adjacent Ellsworth Allen Recreational Park, and the ROD requires recreational use for that parcel. Tax Lot 331 was acquired by the TOB in July 2010 to further expand the park, and, in July 2012, EPA published ESD to change the permitted use of Tax Lot 331 to recreational use. In September 2011, the legislative body of the TOB changed the zoning for Tax Lots 327 and 331 from Light Industrial to Recreational. Furthermore, under New York State legal precedents, once land has been dedicated to municipal parkland use, it cannot be diverted for uses other than recreation, in whole or in part, temporarily or permanently, even for another public purpose, without specific legislative approval of the State of New York. For the Eastern Parcel (Tax Lot 332), the ROD requires that its use be restricted to commercial or industrial purposes. The owner of that Tax Lot has imposed an Environmental Protection Easement and Declaration of Restrictive Covenants against the property restricting its use to commercial or industrial, prohibiting the installation or use of groundwater wells for human consumption, and providing that EPA and NYSDEC be third party beneficiaries with the right to enforce such restrictions. The use of groundwater at all of the Liberty site property is further institutionally controlled by State and County ordinances prohibiting installation or use of groundwater wells for human consumption until the aquifer is restored.

IC Summary Table

Table - Summary of Planned and/or Implemented ICs[1]

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
15-acre Western Parcel (Tax Lot 327), 7.5-acre Central Parcel (Tax Lot 331), and 7.5-acre Eastern Parcel (Tax Lot 332)	Yes	Yes	Lots 327, 331, and 332	Establishing institutional controls in the form of deed restrictions on future uses.	Proprietary ICs: Environmental Protection Easement and Declaration of Restrictive Covenants limit to industrial/commercial use (Lot 332, August 4, 2009); and Agreement and Covenant Not to Sue (Prospective Purchaser Agreement) limit to recreational use (Lot 327, June 10, 2003); Governmental (Legal) IC: Legislative zoning changed for Tax Lots 327 and 331 from Light Industrial to Recreational in September 2011. Furthermore, under New York State legal precedents, once land has been dedicated to municipal parkland use, it cannot be diverted for uses other than recreation, in whole or in part, temporarily or permanently, even for another public purpose, without

[1] The 2002 ROD required ICs to restrict the use of the Site to commercial/industrial or, where applicable, to recreational uses for the soils remedial component and to prohibit installation or use of groundwater wells for human consumption for the groundwater remedial component.

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
					specific legislative approval of the State of New York.
Groundwater	Yes	Yes	Groundwater	Restrict future groundwater use at the Site	Proprietary ICs: Environmental Protection Easement and Declaration of Restrictive Covenants (Lot 332, August 4, 2009) and Agreement and Covenant Not to Sue (Prospective Purchaser Agreement),(Lot 327, June 10, 2003); and Governmental (Legal) ICs through state and local regulations and ordinances prohibiting installation or use of groundwater wells for human consumption until the aquifer is restored.

Systems Operations/Operation & Maintenance

Plume A

Post-construction operation and maintenance (O&M) of the upgraded GRS has been performed by the PRPs in accordance with the Operation, Maintenance, and Monitoring Plan (OMMP), issued with the February 2008 Final 100% Groundwater RD Report and the O&M plans prepared by the PRPs' contractors. These plans discuss general O&M activities, including system monitoring and discharge sampling as well as detailed O&M for each operable piece of equipment in the system. They also discuss Site-wide groundwater monitoring until restoration of the aquifer is complete. The current groundwater monitoring program includes 20 groundwater monitoring wells/piezometers and 10 recovery wells (listed, below, in Section IV. FIVE-YEAR REVIEW PROCESS, Data Review) that are sampled on an annual basis. Previously, the Site property boundary monitoring wells were sampled semi-annually while the off-Site property monitoring wells were being sampled on an annual basis. In 2014, the sampling plan was adjusted so all monitoring wells are sampled on an annual basis.

The approximate mass of contaminants recovered from groundwater sources from October 2002 through December 2016 includes 28.5 pounds of TCE, 475 pounds of cadmium, and 1,952.2 pounds of chromium.

Sediments

The PRPs conducted an enhanced monitoring program in November 2014, which consisted of sediment and surface water chemistry as well as toxicity testing for the lower ponds. The surface water sampling results did not indicate any exceedances of the New York State Ambient Water Quality Standards, but the sediment sampling results revealed one location that exceeded the sediment remedial goal for cadmium. While it has been determined that the remedy continues to be protective of ecological receptors downstream, the PRPs will implementing another enhanced monitoring program event, within the next five years, of the entire Massapequa Creek and Preserve. It will consist of similar surface water and sediment sampling and bioassays that were conducted in November 2014.

Vapor Intrusion

As noted above, vapor intrusion sampling performed prior to this FYR did not show any vapor intrusion impact. Based on these results, from 2010 to 2014, EPA continued to conduct vapor sampling only at the Woodward Parkway elementary school; the sampling results during this period also did not show any vapor intrusion impact as they were below screening levels in sub-slab soils and indoor air. It was determined that one more sampling event would occur at the school during the 2016-2017 heating season. This vapor sampling event was conducted in January 2017 and the results confirm that indoor air and sub-slab air sampling results remain below screening levels. Upon review of all vapor sampling results to date, EPA has determined that soil vapor intrusion investigation is no longer warranted at the Site.

Potential Site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the Site.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table - Protectiveness Determinations/Statements from the 2012 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedy protects human health and the environment because contaminated soils and Pond A sediments have been excavated and disposed of off Site, the pump and treat system is addressing contaminated groundwater, the ICs have been implemented at the Site, and the State and County ordinances prevent groundwater consumption.

Table - Status of Recommendations from the 2012 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
01	Reinstatement of various pre-existing monitoring wells as part of the GRS groundwater monitoring program	Refurbish and reinstate pre-existing monitoring wells MW-9A, MW-36A, MW-10A, MW-10B, and potentially MW-23B, contingent on sampling results from the previously listed wells	Completed	The PRPs satisfactorily addressed in a January 19, 2017 letter how the subject pre-existing monitoring wells will be reinstated as part of the modified GRS groundwater monitoring program.	1/16/2017
01	Plume B Vapor Intrusion Evaluation	Recommend NYSDEC continue to consider the potential VI pathway as part of its ongoing Plume B investigation and remediation	Completed	Plume B vapor intrusion evaluation was conducted and completed by the NYSDEC during the Farmingdale Plaza Cleaners OU 1 investigation which resulted in NYSDEC's March 2012 Farmingdale Plaza Cleaners Site OU 1 ROD.	3/30/2012
01	Enhanced monitoring program for the Massapequa Preserve	Recommend the design and implementation of the enhanced monitoring program	Completed	The enhanced monitoring program was conducted in November 2014 by the PRPs and the results were provided in April 2015 Post-Remediation Pond Sampling Report.	4/2/2015
01	Statistical groundwater data evaluation	Recommend Mann-Kendall statistical trend test on groundwater sampling data for cadmium and chromium as to why there is not overall decreasing trend of Cr6+ in the on-	Completed	This evaluation was conducted by the PRPs in Annual 2014 Site-wide Groundwater Monitoring Report.	4/27/2014

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
		Site/property boundary monitoring wells and also a trend analysis of GRS's mass influent for 2002-present period in order to assess the overall efficiency of the GRS			

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement

On November 14, 2016, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 38 Superfund sites in New York and New Jersey, including the Liberty Industrial Finishing Superfund site. The announcement can be found at the following web address: https://www.epa.gov/sites/production/files/2016-11/documents/five_year_reviews_fy2017_final.pdf.

In addition to this notification, EPA published a public notice of the performance of the second FYR for the Liberty Industrial Finishing Superfund site on EPA's Liberty site webpage as well as on the Town of Oyster Bay Town Hall's website. The announcement indicated that EPA is conducting a second FYR of the remedy for the Site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as intended. Once the FYR is completed, the results will be made available at the local Site repository, the Farmingdale Public Library located at 116 Merritts Road, Farmingdale, New York. In addition, efforts will be made to reach out to local public officials to inform them of the results. The notice included the telephone number, email and postal address of the RPM and Community Involvement Coordinator for questions related to the second FYR process or the Liberty Site. Interviews were not conducted as part of the FYR.

The EPA FYR team consisted of:

Lorenzo Thantu - Remedial Project Manager
Sal Badalamenti - Chief, Eastern NY Remediation Section
Michael Mintzer - Assistant Regional Counsel
Cecilia Echols - Community Involvement Coordinator
Abbey States – Human Health Risk Assessor
Katherine Mishkin – Hydrogeologist
Michael Clemetson – Ecological Risk Assessor
Kate Garufi - EPA Headquarters FYR Coordinator
Chloe Metz – Region 2 FYR Coordinator

Data Review

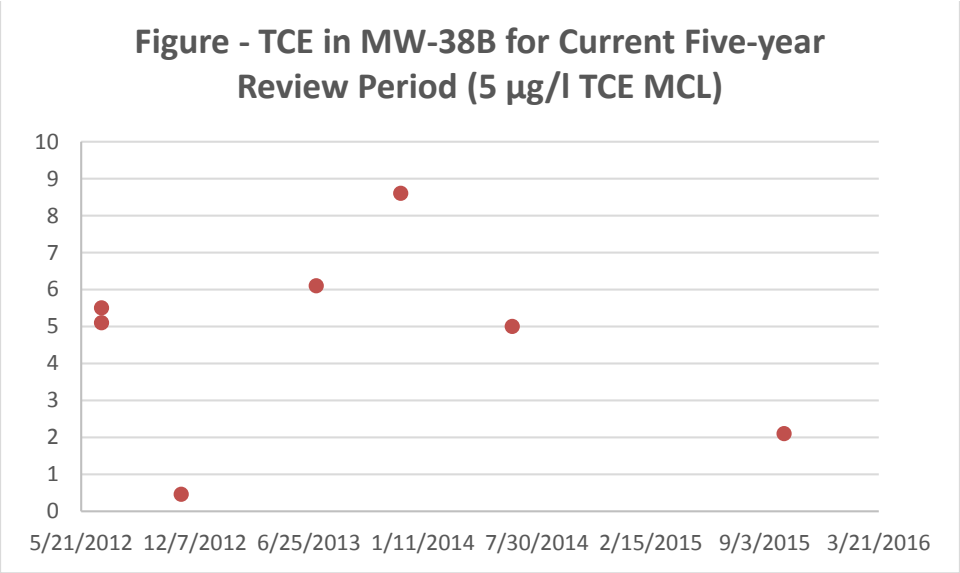
Plume A

Water levels and direction of groundwater flow have been evaluated under both static (non-pumping) and pumping conditions. In the UGA and the MA, the direction of groundwater flow under static conditions is toward the south-southwest and flow is mostly horizontal, with some vertical gradients varying seasonally between aquifers. Groundwater flow under pumping conditions is also similar in the south-southwest direction with some mounding effects associated with discharge to infiltration galleries and areas of depression around active pumping wells. Recovery wells are in both the UGA and MA. RW-1, RW-2, and RW-3A are on the property and pump from the UGA. RW-4, RW-5, RW-6, RW-7 are downgradient of the property (mid-field and far-field) and extract groundwater from the UGA. RW-8, RW-9, RW-10 are downgradient of the property and extract groundwater from the MA (mid-field). Previous groundwater modeling conducted has shown that the capture zone from on-Site UGA recovery wells extends to the width of the property and more than 150 feet downgradient (**Figure 8**) (**Note:** Monitoring wells labeled A are in the upper portion of the UGA, while monitoring wells labeled B are in the deeper portion of the UGA). Similarly, the capture zone for the downgradient UGA recovery wells extended beyond the width of VOC and cadmium/chromium plumes (**Figure 9**). The capture zone of the downgradient MA recovery wells is shown on **Figure 10**.

Pulse pumping was initiated during this FYR period in March 2012. The purpose of pulse pumping is to attempt to enhance capture of the contaminated groundwater by the existing pump and treat system. In general, recovery wells do not show a clear difference in concentration data when compared to trends prior to initiating pulse pumping. Two exceptions are RW-3A for cadmium and RW-7 for total chromium where concentrations show increasing trends following the onset of pulse pumping which may be indicative of enhanced recovery during pulse-pumping cycles (**Figure 11 and 12**). Overall the data show similar removal efficiencies meaning both total mass volume and volume of groundwater being extracted from the aquifers are less since pumping is not continuous. In 2015, the extraction system removed 49.7 Mgal water, 0.3 pounds (lbs) of TCE, 27 lbs of cadmium, and 26 lbs of total chromium. The 2013 operational data from the pulse-pumping program, in general, show that pulse program has been successful, but with some modifications and adjustments, in efficiently removing cadmium and chromium contamination from the groundwater. The 2013 data, provided in **Table 5**, shows that the average concentrations of cadmium, chromium, and hexavalent chromium at the on-Site recovery wells, RW-1, RW-2, and RW-3A, screened in the UGA, have continued to decrease, providing evidence that the source of the plume has already been removed. This is consistent with the intent of the pulse program as originally envisioned.

On-Site/Property Boundary - Upper Glacial Aquifer - VOC Data

During the 2015 sampling event, the only organic constituents detected at concentrations exceeding NYSDEC groundwater criteria in the on-Site/property boundary wells was 1,1,1-TCA in MW-7A at 22 micrograms/liter (µg/l). The only on-Site/Property Boundary well showing any TCE exceedances was MW-38B. During this FYR period, MW-38B showed TCE concentrations just above the NYSDEC criteria of 5 µg/l (5.1 µg/l in June 2012, 6.1 µg/l in July 2013, and 8.6 µg/l in December 2013), but most recently exhibited an overall decreasing trend with concentrations below criteria during the 2015 sampling event (**Figure 13**). Low level concentrations of cis-1,2-DCE were present in MW-7A, MW-39A, and MW-39B which indicates that some dechlorination is occurring in the UGA, but vinyl chloride is not present in these monitoring wells. Monitoring wells located on the property and screened in the MA are not currently sampled but just used for water level measurements. Monitoring in the MA on-Site/property boundary wells was discontinued after several rounds of results below detection limits.



On-Site/Property Boundary - Upper Glacial Aquifer - Cadmium and Chromium Data

Overall, cadmium and chromium concentrations remain above their respective criteria of 5 µg/l and 50 µg/l, respectively, in the UGA. In 2015, cadmium was detected in three recovery wells (RW-1, RW-2, RW-3A) and 11 on-Site/property boundary wells at concentrations above the NYSDEC groundwater criteria of 5 µg/l. MW-2AR and MW-2BR are two on-Site wells near the mid-point of Plume A. Cadmium concentrations were historically higher in the upper portion of the UGA (MW-2AR) than the lower portion (MW-2BR), but concentrations in MW-2AR have declined considerably since June 2011 from 590 µg/l to 39.5 µg/l in July 2016. The cadmium concentration in adjacent well MW-2BR has generally been much lower than in MW-2AR but showed a historic high in November 2008 (261 µg/l) and has shown a decrease in concentrations since 2008. The cadmium concentration in MW-5 has shown an overall decline since 2008. In the boundary monitoring wells downgradient of the former disposal basins (well pairs MW-38A/B, MW-39A/B, and MW-40A/B), cadmium concentrations in October 2015 ranged from 7.6 to 97.8 µg/l. While this concentration range is lower than some of the historic concentrations of cadmium found in groundwater, overall the data show a lot of variation. However, since 2010, some wells show decreasing concentrations such as MW-38A. MW-40B has decreased significantly and is approaching the groundwater standard (**Figure 14** and **Figure 15**).

In 2015, total chromium concentrations detected in two recovery wells (RW-2, RW-3A) and 7 on-Site/property boundary wells exceeded the NYSDEC groundwater standard of 50 µg/l. Monitoring wells remaining above the groundwater standard are typically in the upper portion of the UGA. Samples collected from the majority of monitoring wells screened in the lower portion of the UGA such as MW-38B, MW-39B, MW-40B have consistently shown total chromium concentrations below the standard since at least 2004. Since monitoring was initiated, the most dramatic decline in total chromium concentrations has been observed in MW-40A; however, most recently the concentration rose from 55 µg/l in June 2014 to 117 µg/l in October 2015 down to 105 µg/l in July 2016. This is consistent with the fluctuations observed historically (**Figure 14** and **Figure 16**).

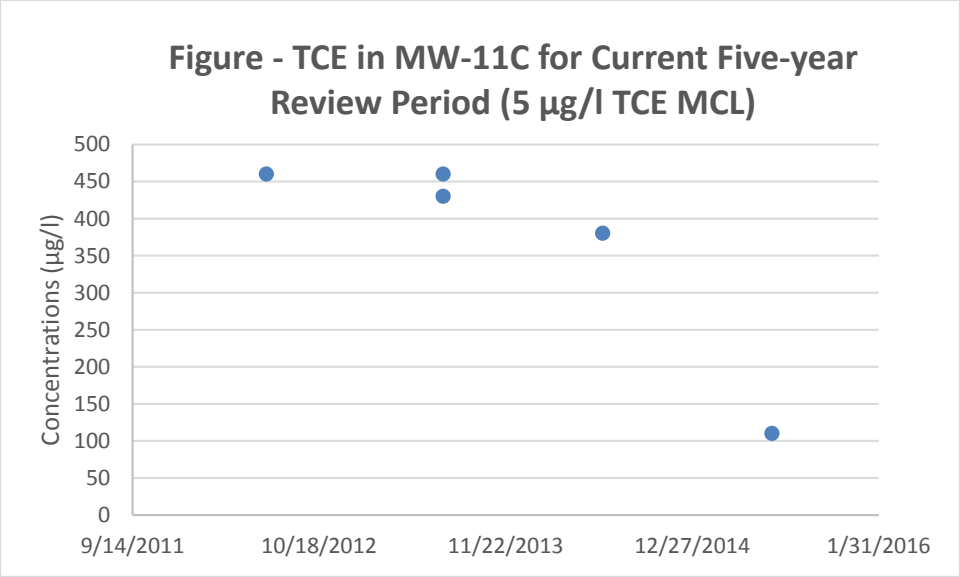
Previous sampling data indicates that metals are not a concern in the MA on Site and at the property boundary.

Mann-Kendall statistical trend test was also conducted by the PRPs on groundwater sampling data for cadmium and chromium as to why there is not overall decreasing trend of Cr6+ in the on-Site/property boundary monitoring wells and also a trend analysis of GRS's mass influent for 2002-present period in order to assess the overall efficiency of the GRS. The statistical trend analytical results show that the majority of the on-Site and boundary wells exhibit no statistically significant trend or a decreasing trend in cadmium and chromium concentrations. There were some exceptions to this and several wells showed an increasing trend, although concentrations have declined in recent years. In the mid-field UGA wells, no statistically significant trends in cadmium concentrations were found for three wells, decreasing trends were observed at three wells, and one well exhibited an increasing trend. Total chromium in the midfield wells exhibited increasing trends in three wells, decreasing trends in two wells, and no trend in in two wells. Decreasing trends at the Site and increasing trends in the mid-field suggest a diminishing plume at its source with migration and capture by the mid-field recovery wells. Similarly, detected cadmium and chromium concentrations are increasing or remaining relatively consistent at the downgradient end of the plume at recovery well RW-7 and monitor well PZ-14 due to capture by RW-7.

Off-Site – Upper Glacial Aquifer and Magothy Aquifers – VOC Data

VOC contamination within the UGA includes PCE in Plume B (addressed by NYSDEC) and TCE downgradient of the Liberty property. The presence of TCE is based on a previous grab sample collected from a temporary groundwater profile boring PW-15.

During the 2015 sampling event, TCE was detected in 20 off-Site monitoring wells but only one monitoring well showed an exceedance of the NYSDEC groundwater standard. Most of the monitoring wells in the current sampling program are screened in the UGA. MW-11C is screened in the MA and has consistently shown TCE exceedances above the standard. TCE in MW-11C has historically fluctuated between 1,300 µg/l in July 1992 to non-detect in June 2010 (**Figure 17**). Since June 2010, the TCE concentration in MW-11C has been relatively consistent between 380 to 500 µg/l. During this FYR period, the TCE concentrations showed an overall decrease to 110 µg/l in 2015 (see **Figure - TCE in MW-11C for Current Five-year Review Period**, below). TCE exceedances were also found in the deeper MA screened monitoring well MW-11D but show an overall decreasing trend during this review period and TCE was not detected in the June 2015 sample (**Figure 17**). MW-11C and MW-11D are within the capture zone of the mid-field MA recovery wells. MW-29C is up- and sidegradient of MW-11C/D. This monitoring well was last sampled in June 2012 and showed TCE exceeding the NYSDEC groundwater standard at 9.9 µg/l. MW-11C and MW-11D showed low level cis-1,2-DCE and vinyl chloride concentrations indicating some dechlorination is occurring in the MA. Cis-1,2-DCE and vinyl chloride were also found in RW-8 during this FYR period.



Off-Site – Metals Data

As discussed above, cadmium and total chromium concentrations in groundwater remain limited to the UGA and are generally not present in the MA. While there are less monitoring wells screened in the MA since they were removed from sampling program after several rounds of data showing no Site related contaminants, MW-29C showed cadmium at 12 µg/l in 2012 when it was last sampled. This lower level detection exceeding the NYSDEC groundwater criteria is evidence of hydraulic communication between the UGA and MA. In the UGA, cadmium and chromium concentrations are higher in the mid-field area as compared to concentrations found on the property. In 2015, cadmium has shown concentrations exceeding the groundwater standard of 5 µg/l in 12 off-Site monitoring wells and three recovery wells (RW-4, RW-5, RW-6). The maximum concentration of 1,030 µg/l was detected in RW-6 and the furthest downgradient exceedance was in the Massapequa Preserve in PZ-14. Concentrations of cadmium show long-term declines with some exceptions. MW-29B has been relatively consistent around 30 µg/l, MW-17B has shown a lot of variability since 2010 and cadmium found in MW-25B had been increasing since June 2010, but declined from 220 µg/l in 2014 to 62.1 µg/l in 2015 (**Figure 14** and **Figure 18**). Since MW-25B is adjacent to mid-field recovery wells, this may be why higher concentrations have been observed at this well. Monitoring wells in the farfield area such as MW-9A/9B show an overall decreasing trend (**Figure 14** and **Figure 19**).

In 2015, total chromium was detected in six off-Site wells at levels exceeding the groundwater standard of 50 µg/l. The concentration of total chromium found in far-field recovery well RW-7 has been slowly increasing and most recently was just below the standard of 50 µg/l (48.7 µg/l) (**Figure 14** and **Figure 20**). In far-field monitoring well MW-9B total chromium concentrations have decreased.

Groundwater Summary

Groundwater underlying the Liberty site flows in the south-southwest direction in the UGA and MA under static and pumping conditions. The contaminants of concern are principally TCE, cadmium, and total chromium. TCE and VOCs in general are more widespread compared to metals contamination and present at mostly lower level concentrations, with some persistent concentrations above the NYSDEC groundwater criteria. VOC contamination underlying the property is restricted to the UGA, while the deeper MA has not shown the presence of VOCs underlying the property. Downgradient of the property, VOCs are present in both the UGA and

the MA, with the highest levels persistently found in two monitoring wells, MW-11C and MW-11D – both of which have shown an overall decreasing trend in TCE concentrations and the presence of degradation products (e.g. cis-1,2-DCE, vinyl chloride).

The presence of cadmium and total chromium is mostly limited to the shallower UGA underlying the property and downgradient of the property. The exception where cadmium was found in the downgradient MA may be indicative of a hydraulic connection between the shallower UGA and the deeper MA. Cadmium and total chromium are generally found at higher concentrations in the downgradient UGA compared to the UGA underlying the property. Overall, Site-wide cadmium and chromium concentrations have shown a decreasing trend.

Sediments

The enhanced monitoring program involving periodic sediment and surface water chemistry as well as toxicity testing for the lower ponds is conducted to ensure that the remedy will continue to be protective of ecological receptors downstream. Based upon the review of the April 2015 Post-Remediation Pond Sampling Report, surface water sampling did not indicate any exceedances of the New York State Ambient Water Quality Standards. The sediment sampling revealed one location that exceeded the sediment remedial goal for cadmium. The sediment toxicity testing indicated that there was no statistically significant difference in survival of either the *Hyalella Azteca* and *Chironomus dilutus*. Although growth was significantly different in most of the Massapequa pond samples, some of the impacted samples were in locations with the lowest cadmium and chromium concentrations. Consequently, the toxicity may not be associated with the contaminants.

Vapor Intrusion

As stated above, the most recent vapor sampling event was conducted at the Woodward Parkway Elementary School in January 2017 and the results confirm that indoor air and sub-slab air sampling results remain below following screening levels, 0.48 micrograms/cubic meter (µg/m3) indoor air and 16 µg/m3 sub-slab air for TCE and 11 µg/m3 indoor air and 360 µg/m3 sub-slab air for PCE, which were established at a set cancer risk of 10^{-6} and hazard quotient of 1.

Site Inspection

A Site inspection was performed on November 15, 2016 by the following EPA and NYSDEC personnel:

EPA
Lorenzo Thantu - Remedial Project Manager
Cecilia Echols - Community Involvement Coordinator

NYSDEC
Heather Bishop, Project Manager
John Swartwout, Section Chief

V. TECHNICAL ASSESSMENT

QUESTION A*: Is the remedy functioning as intended by the decision documents?*

Question A Summary:

The main elements of the 2002 ROD include excavation and disposal of contaminated on-Site

soils, removal of contaminated materials from underground storage tanks and other subsurface features, excavation and disposal of contaminated sediments within Pond A, implementation of a monitoring program for the remainder of the ponds within Massapequa Preserve, construction and operation of pump-and-treat systems for Plume A, implementation of a groundwater monitoring program, and ICs to prevent access to groundwater and maintain land use. All of these remedial components have been implemented and groundwater and sediment operation, maintenance, and monitoring activities are ongoing.

The full pump and treat construction was completed in 2009/2010 to include off-Site recovery wells; pulse pumping was initiated in 2012. Pulse pumping does not appear to be pulling a higher rate of mass from the aquifer except for two possible exceptions at RW-3A for cadmium and RW-7 for total chromium where increasing trends are shown following the onset of pulse pumping.

On-Site/property boundary monitoring wells show that VOCs have nearly reached remedial goals with the exception of one monitoring well in the UGA (MW-7A). Maximum Site-wide VOC concentrations are found downgradient of the property in an area known as the mid-field in the MA (MW-11C and MW-11D). The maximum TCE concentration of 160 µg/l was detected in MW-11D during this review period. While concentrations have varied historically, MW-11C and MW-11D have shown a decreasing trend during this review period. In addition, as stated above in SECTION I. INTRODUCTION, Site Background, periodic monitoring of the six sentinel wells has not detected any Site-related Plume A or Plume B contamination, indicating that the on-Site GRS pumping and treatment is operating as intended and the plumes are stable.

Site-wide cadmium and chromium concentrations are lower than historic levels but recent concentration trends have varied depending on the monitoring well. Maximum cadmium and chromium concentrations are found in the mid-field area, but in the UGA rather than the MA where maximum VOCs reside. Mid-field monitoring wells showing maximum Site-wide cadmium and chromium concentrations in 2015 were RW-6 (1,030 µg/l) and MW-17B (269 µg/l), respectively. Both of these wells are depicted to be within the capture zone of the mid-field UGA recovery wells so the plumes should not migrate outside the current extent of contamination, but will continue to be monitored to ensure this does not occur.

The remedy has eliminated exposure to ecological receptors through the excavation and off-Site disposal of the contaminated sediment in Massapequa Creek. The enhanced monitoring program involving periodic sediment and surface water chemistry and the toxicity testing for the lower ponds was last conducted in November 2014. The review of the April 2015 Post-Remediation Pond Sampling Report indicates that the surface water sampling did not indicate any exceedances of the New York State Ambient Water Quality Standards and sediment sampling and analysis did not show an impact to biota based on sediment toxicity testing.

All ICs have been implemented at the Liberty site and the ESD, which was published by EPA in July 2012, notified the public of the change in the permitted use from commercial-industrial to recreational for the Central Parcel.

QUESTION B*: Are the (a) exposure assumptions, (b) toxicity data, (c) cleanup levels and (d) remedial action objectives used at the time of the remedy selection still valid?*

Question B Summary:

Although specific parameters may have changed since the time the risk assessment was completed, the process that was used remains valid and is not expected to affect the remedy. The exposure

assumptions, toxicity data, cleanup levels and RAOs identified for the Liberty site remain valid. There are no changes in the physical conditions of the Site or Site uses that would affect the protectiveness of the selected remedy.

Changes in land use requirements necessitated updates to the July 2000 BHHRA and March 2002 BHHRA Addendum, which were the basis for the remedy selected in the 2002 ROD. The Central Parcel was previously zoned for commercial/industrial use. The November 2011 updated Risk Assessment then evaluated the Central Parcel as an extension of the recreational Ellsworth Allen Park for protectiveness for recreational land use as requested by the Town. The November 2011 updated Risk Assessment concluded that soil conditions in the Central Parcel, upon completion of the soils and subsurface features remedial action in September 2011, are protective of a recreational land use scenario for this area.

While a new toxicity value for TCE was released in September 2011, the toxicity value used in the human health risk assessment and addenda are still protective of human health. The groundwater MCL remains at 5 µg/l, and the selected cleanup level for soils remains more stringent than the new residential TCE soil levels currently utilized by the State of New York. Therefore, the cleanup goals presented in the 2002 ROD are still valid.

The cleanup goal selected for chromium in groundwater is the state ARAR of 50 µg/l. Hexavalent chromium toxicity is currently under review; therefore, this value could change in the future. Since the groundwater treatment system is currently capturing the chromium contamination and downgradient properties are on public supply, there is not a completed exposure pathway. However, future FYRs will need to consider changes in toxicity.

Soil vapor intrusion (SVI) is evaluated when soils and/or groundwater are known or suspected to contain VOCs. Previous VI sampling of several residences and Woodward Parkway Elementary School indicated that the vapor intrusion pathway is not an issue at the Site. The most recent sampling event conducted at the Woodward Parkway Elementary School in January 2017 confirms that indoor air and sub-slab air sampling results remain below screening levels.

In addition, although the ecological risk assessment screening values used to support the 2002 ROD may not necessarily reflect the current values, the selected cleanup levels and screening values are still appropriate.

QUESTION C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

Question C Summary:

No other information has come to light which calls into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

This report did not identify any issue or make any recommendation for the protection of public health or the environment which was not included or anticipated by the Site decision documents. However, this report includes suggestions for improving, modifying, and/or adjusting some of these activities (see Other Findings, below).

OTHER FINDINGS

The following is a recommendation that was identified during the FYR and may improve management of O&M activities, but does not affect current and/or future protectiveness:

- Because the sediment monitoring data (discussed above in Section V. TECHNICAL ASSESSMENT) indicated an exceedance of the sediment remedial goal for cadmium at one location, the enhanced monitoring program for the Massapequa Preserve should be continued.

VII. PROTECTIVNESS STATEMENT

Protectiveness Statement(s)		
Operable Unit: 1	*Protectiveness Determination:* Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The remedy at OU 1 is protective of human health and the environment.		

Sitewide Protectiveness Statement	
Protectiveness Determination: Protective	*Planned Addendum Completion Date:* Click here to enter a date
Protectiveness Statement: The remedies implemented for the Site are protective of human health and the environment.	

VIII. NEXT REVIEW

The next FYR report for the Liberty Industrial Finishing Superfund site is required five years from the completion date of this review.

APPENDIX A-REFERENCE LIST

Documents, Data, and Information Reviewed in Completing the Five-Year Review:

1) Record of Decision for the Liberty Industrial Finishing Superfund Site *March 28, 2002*

2) Administrative Order on Consent for Removal Action for Phase I Demolition, *March 21, 2002*

3) Remedial Design & Remedial Action Consent Judgment *September 30, 2003*

4) Pond Sediments Remedial Action Report *December 2008*

5) Groundwater Remedial Action Report *September 2010*

6) Site-wide Groundwater Monitoring Program Report for 2005 Summer *November 2005*

7) Site-wide Groundwater Monitoring Program Report for Semiannual Period (July to December 2010) *June 2011*

8) Proposed On-Site GWTF Pulse Pumping Proposal to Improve Contaminant Recovery Efficiency Memorandum *August 2011*

9) Site-wide Groundwater Monitoring Program Report for Semiannual Period (January to June 2011) *December 2011*

10) Soils and Subsurface Features Remedial Action Report *September 2010*

11) Soils and Subsurface Features Remedial Action Report Addendum *September 2011*

12) Site Management Plan for the Western and Central Parcels *March 18, 2011*

13) Public Health Consultation Letter *September 16, 2009*

14) Update of Risk Assessment Addendum (Central Parcel) to the Baseline Human Health Risk Assessment *November 2011*

15) First Five-Year Review *June 2012*

16) Explanation of Significant Differences *July 2012*

17) Record of Decision Amendment for the Liberty Industrial Finishing Superfund Site *September 2012*

18) 2012 Annual Site-wide Groundwater Monitoring Report (Jun & Nov 2012 Sampling Events) *July 2013*

19) 2013 Semi-Annual (Boundary & Annual Key MW) Sampling Letter Report *October 2013*

20) 2013 On-Site Groundwater Treatment Facility Pulse Pumping Program Summary Memorandum *January 2014*

21) 2014 Annual Site-wide Groundwater Monitoring Report *April 2015*

22) 2015 Post-Remedial Action Enhanced Pond Sampling Report *April 2015*

23) 2015 Annual Site-wide Groundwater Monitoring Report *July 2016*

24) 2016 Annual Site-wide Groundwater Monitoring Report *June 2017*

APPENDIX B-TABLES

Table 1: Chronology of Events

DATE	EVENT
June 1986	Listing of Liberty Industrial Finishing Superfund Site on NPL
January 1994	EPA completion of Initial RI Report
April 1996	PRP completion of PCB Removal Action
July 1997	EPA completion of Initial FS Report
April 2001	PRP completion of Supplemental RI/FS
March 2002	ROD for Comprehensive Remedy
December 2002	NYSDEC's Listing of Farmingdale Plaza Cleaners Site on its Registry of Inactive Hazardous Waste Disposal Sites
December 2008	PRP completion of Subsurface Features Removal Action
December 2008	PRP Completion of Pond Sediments RAR
September 2010	PRP Completion of Groundwater RAR
September 2010	PRP Completion of Soils and Subsurface Features RAR
September 2011	PRP Completion of Soils and Subsurface Features RAR Addendum
June 2012	First Five-Year Review
July 2012	Explanation of Significant Differences
September 2012	Amendment to the 2002 ROD

Table 2 - Chronology of Major Groundwater Remediation System Construction Events

Si. No.	Event	Date	Task Description
1	Notice to Proceed (NTP) Issued	5/29/2009	The EPA conditional approval of the Remedial Action Work Plan (RAWP) received; NTP issued to Prime Contractors
2	Moretrench Site Mobilization	6/8/2009	Moretrench American Corporation (Moretrench) began mobilizing to the site for treatment system and recovery well work
3	Preconstruction Meeting	6/11/2009	Discussed project expectations, lines of communication, record keeping, health and safety, and project schedule, among other things. Supervising Contractor, Engineer, and Prime Contractors present.
4	Selective Demolition	6/12/2009	Moretrench began demolition and removal of existing treatment system components
5	Well Installation, Main Site	6/24/2009	Moretrench began drilling wells and piezometers at the Site
6	Temporary Interim Treatment System Completed	6/29/2009	Interim treatment system completed for operation during construction activities
7	Recovery Well Installation, School Property	6/30/2009	Moretrench began drilling wells and piezometers at the School Property
8	Treatment System Construction	7/8/2009	Begin construction of new treatment system, including process equipment, piping, fittings, and valves.
9	Bove Site Mobilization and Preparation	8/3/2009	Bove began digging test pits for utilities; equipment and materials delivered to Site
10	Pipeline Installation, Main Site and School Property	8/26/2009	Bove began installing pipelines at the Site and School Property by open trenching; Piping connections to recovery wells installed
11	Pipeline Installation, Residential Neighborhoods Rights-of-Way (ROWs)	9/8/2009	Bove began installing pipe through the residential neighborhoods by horizontal directional drilling (HDD)
11	Massapequa Preserve Permits Approved	9/25/2009	Received utility easement and work permit for construction in the Preserve; NTP issued to contractors upon receipt of signed permits
12	Preserve Mobilization and Preparation	9/30/2009	Bove began preparation in the Preserve including limited clearing and trimming, installation of silt fence at Massapequa Creek crossing
13	Pipeline Installation, Massapequa Preserve	10/1/2009	Began pipelines installation in the Preserve by HDD
14	Well Installation, Massapequa Preserve	10/5/2009	Moretrench began drilling PZ-14 and RW-7 in the Preserve
15	Control Panel Installations	10/23/2009	Moretrench and Elemco transferred the Electrical Control Panels from the Motor Ave. building to 1st Ave. extraction wells location and secured the panels to the concrete pad. Elemco began pulling wire from the well chambers to the Electrical Control Panel.
16	Treatment System Startup and Testing	2/3/2010	Five-day test of treatment system begins
17	Complete System Testing	2/9/2010	Five-day test of treatment system ends

Table 2 - Chronology of Major Groundwater Remediation System Construction Events (Continued)

Si. No.	Event	Date	Task Description
18	Contractor Demobilization	2/10/2010	Moretrench demobilizes off site
19	Substantial Completion Inspection	2/12/2010	Moretrench contract substantially completed in accordance with Remedial Design documents
20	United States Environmental Protection Agency Pre-Certification Inspection	9/7/2010	

Note: This table does not include events for Remedial Element III prior to 5/29/2009.

Table 3 - Groundwater Recovery System Design Flow Rate as Modified by Pulse Pumping

Liberty Industrial Finishing Site Farmingdale, NY

Current Pulse Pumping Schedule

Well	On (days)	Off (days)	Rate (gpm)	Days On/Month	Gal/month	Percent	Total gal/month
RW-1	1	4	60	6	518,400	25	1,872,000
RW-3A	1	3	30	8	345,600	17	
RW-6	1	2	70	10	1,008,000	58	

Month = 30 days

Current Pumping Schedule - Non-Pulsing Wells	
Well	**Pumping Setpoint (gpm)**
RW-2	20
RW-3	35
RW-4	45
RW-5	45
RW-7	50
RW-8	30
RW-9	30
RW-10	35

Table 4 - Chronology of Major Pond Sediments Remedial Action Construction Events

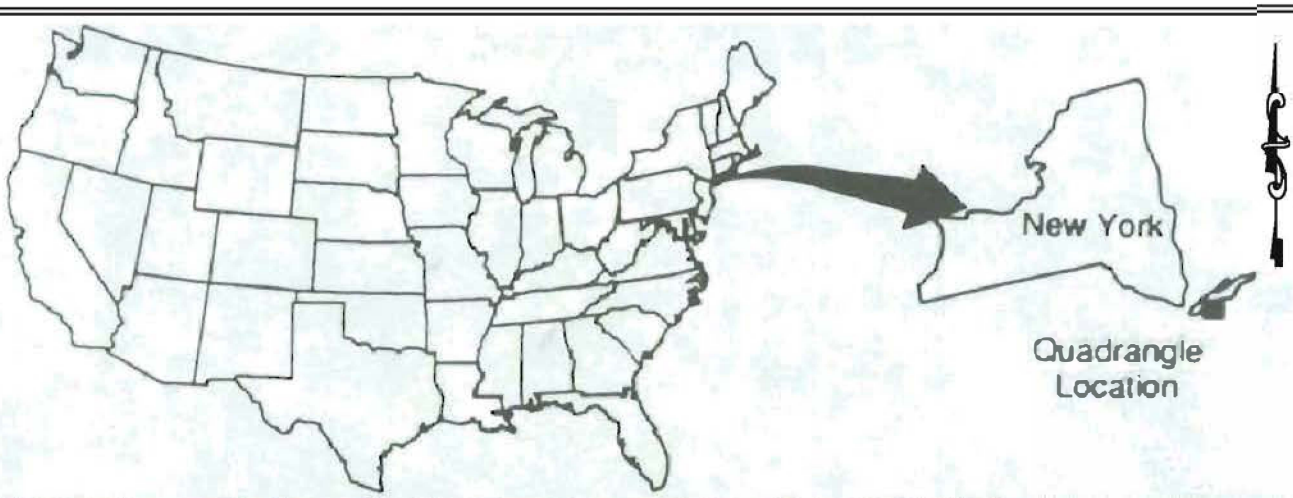
Si. No.	Event	Date	Task Description
1	Pre Construction Meeting	5/15/2008	ENTACT's site supervisor, health & safety officer, PRP representative, EEEPC project manager, and construction oversight were present at the meeting
3	Clearing/Grubbing	5/21/2008	Removed small trees, shrubs, vegetation
4	Support Facilities	5/28/2008	Received office trailers, furniture, file cabinets
5	Site Preparation	6/13/20008	Install by-pass systems, installed perimeter fences, silt fencing, sediment trap, decontamination pad, water treatment systems, post-excavation survey
6	Pond Sediment Excavation	6/27/2008	Remove contaminated sediment from pond and transport off-site
7	Demobilization	8/21/2008	Demobilization of Equipment and Supplies
8	Begin Site Restoration	9/3/2008	Planting, Grading
9	End Site Restoration	9/25/2008	--
10	Substantial Completion Inspection	10/3/2008	--
11	USEPA Pre-Certification Inspection	11/18/2008	--

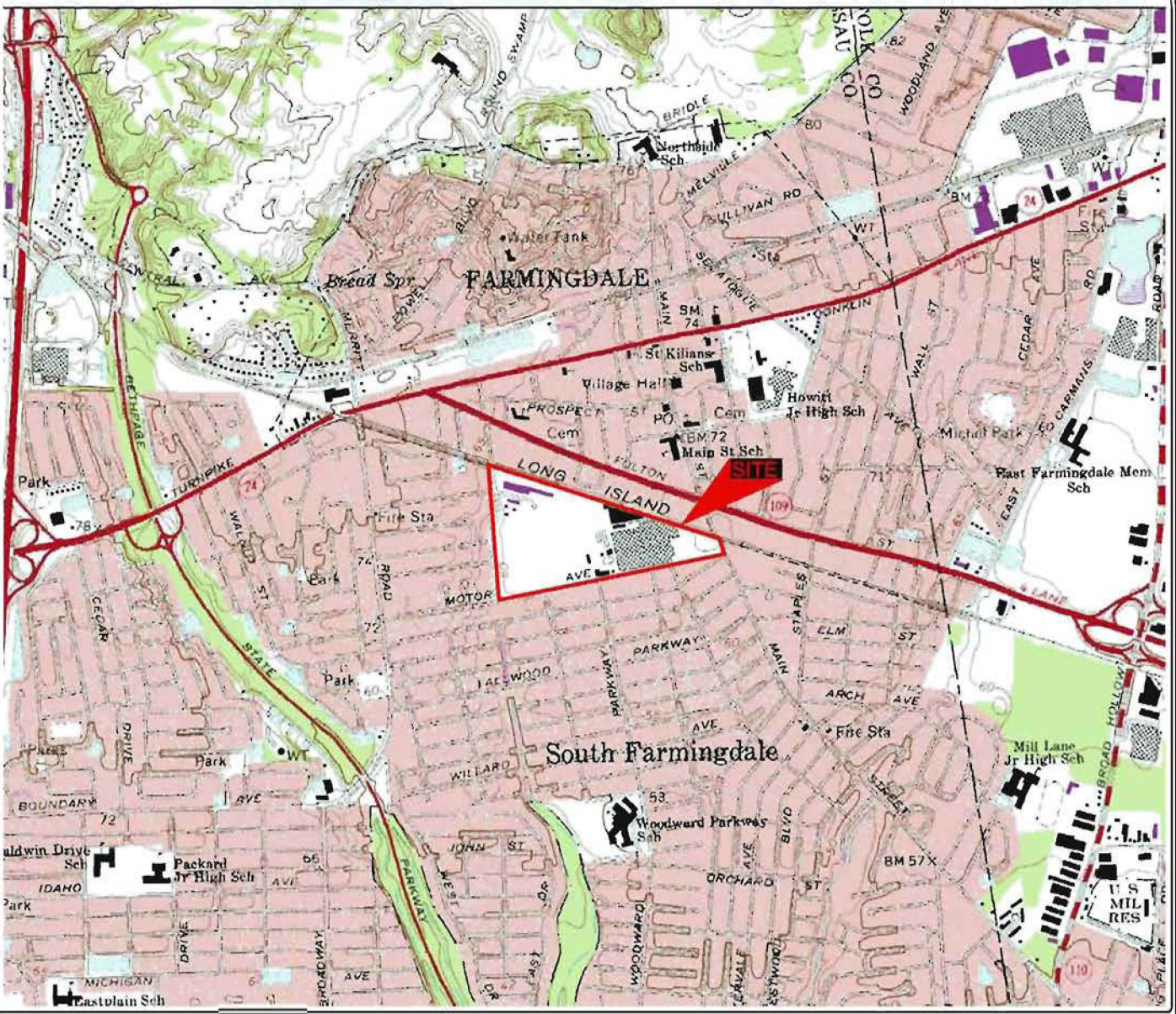
Note: The table does not include events at Pond A before May 15, 2008.

Table 5 - 2013 Pulse-Pumping Operational Data (Average Pounds/Million Gallons Pumped)

	Average Prior to Pulsing (lbs/Mgal)	Mass Removed Per Day Prior to Pulsing (lbs)	Average Since Start of Pulsing (lbs/Mgal)	Mass Removed Per Day of pumping Since Start of Pulsing (lbs)
	RW-1			
Cadmium	0.65795	0.0572	0.55934	0.036
Chromium	3.39304	0.2951	0.23171	0.015
	RW-2			
Cadmium	2.94309	0.075	0.82914	0.018
Chromium	9.34851	0.2383	0.14770	0.003
	RW-3A			
Cadmium	0.10748	0.003	0.65892	0.019
Chromium	0.53565	0.015	0.23867	0.007

APPENDIX C-FIGURES





LEGEND:

GRAPHIC SCALE

1000 0 1000 2000

1 inch = 2000 ft.

SOURCE: UNITED STATES GEOLOGICAL SURVEY 7.5 MINUTE SERIES AMITYVILLE, NY QUADRANGLE 1979

TITLE: SITE LOCATION MAP

PROJECT: LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK

CLIENT NAME: USEPA

WESTON MANAGERS DESIGNERS/CONSULTANTS

DATE: MARCH 2002

FIGURE #: 1

00561TopomapFig1

FIGURE 1 - SITE LOCATION MAP

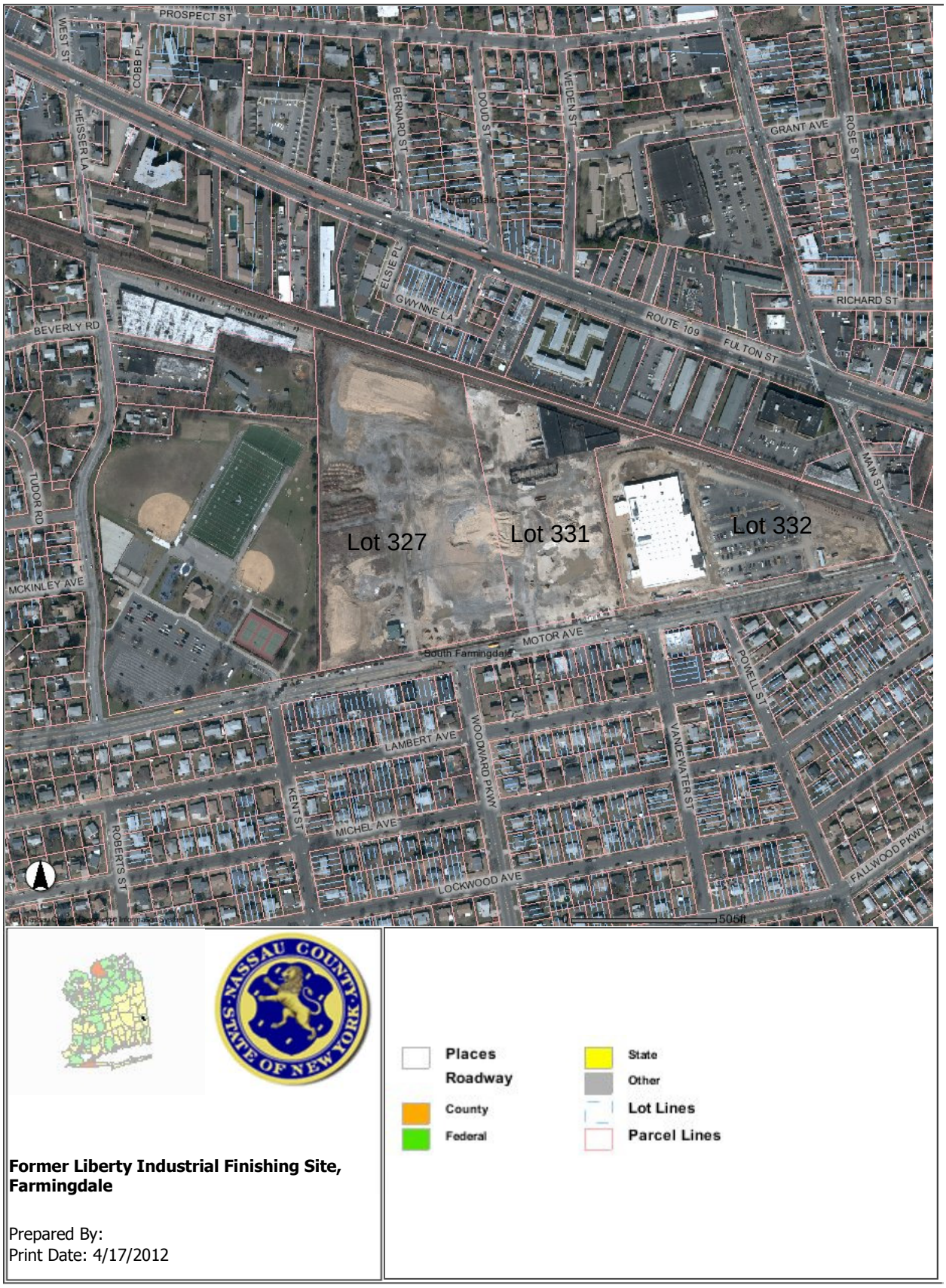


Figure 2 – Current Map of Liberty Tax Lots 327, 331, and 332

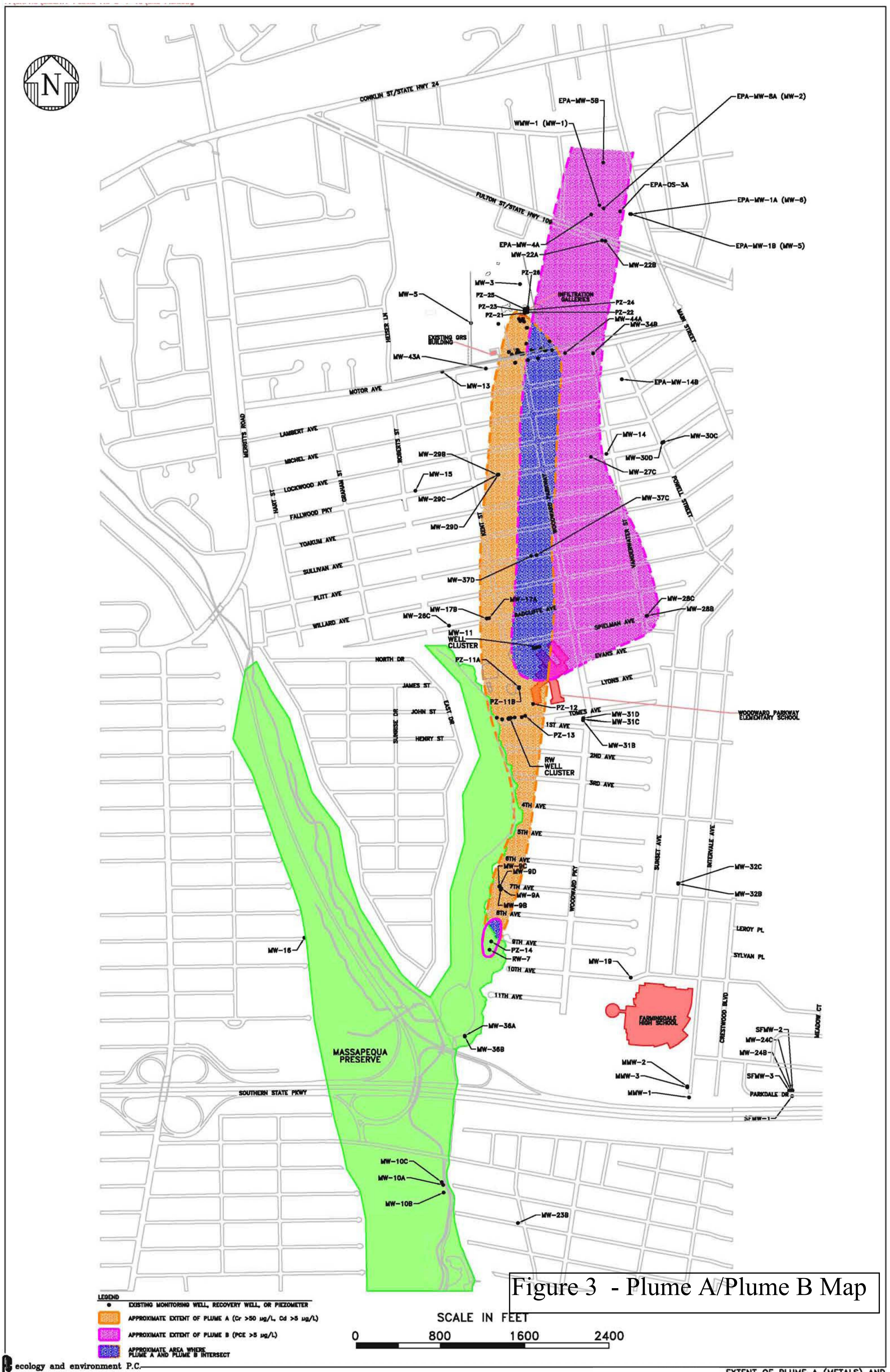
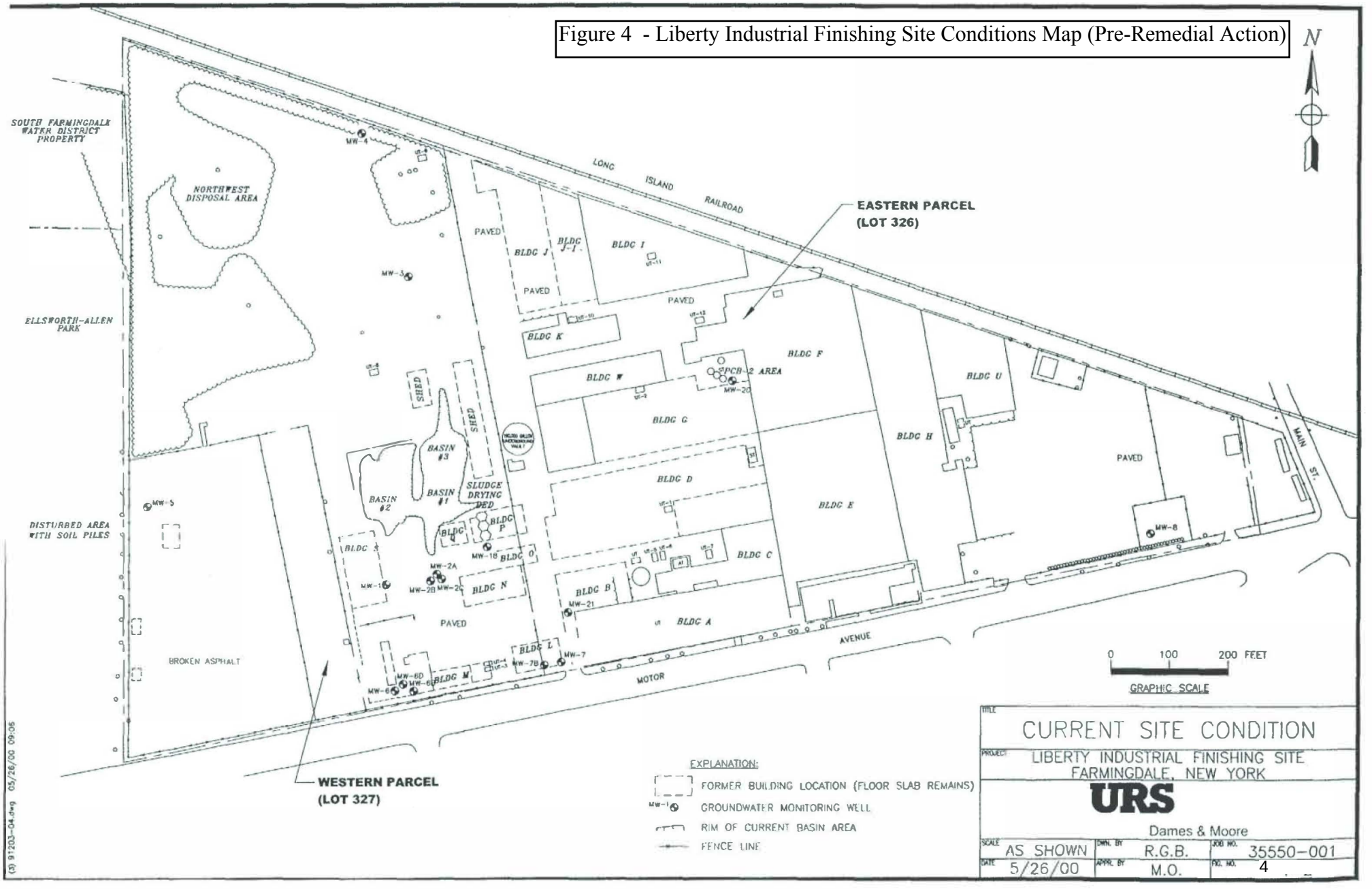


Figure 3 - Plume A/Plume B Map

Figure 4 - Liberty Industrial Finishing Site Conditions Map (Pre-Remedial Action)




Legend
Site
Transect
Roads
Figure 5
Farmingdale Plaza Cleaners Site Location Map
N
0 100 200 400
Feet
PREPARED FOR:
New York State Department of Environmental Conservation
Farmingdale Plaza Cleaners
Nassau County, New York
PREPARED BY:
YU & Associates, Inc.
DATE: 02/25/2009
PROJECT NO.: 08021
DRAWN BY: YZ
CHECKED BY: MG
FARMINGDALE PLAZA CLEANERS
GARDEN APARTMENTS
LIBERTY INDUSTRIAL FINISHING SITE
TRANSECT 1
TRANSECT 2
Prospect St
Bernard St
Weiden St
Main St
Grant Ave
Cherry St
Rose St
Richard St
Fulton St
Van Cott Ave
Gwynne Ln
Walker Pl
Motor Ave
Kent St
Lambert Ave
Vandewater St
Powell St
Michel Ave
James St
Henry St
Vin Ct

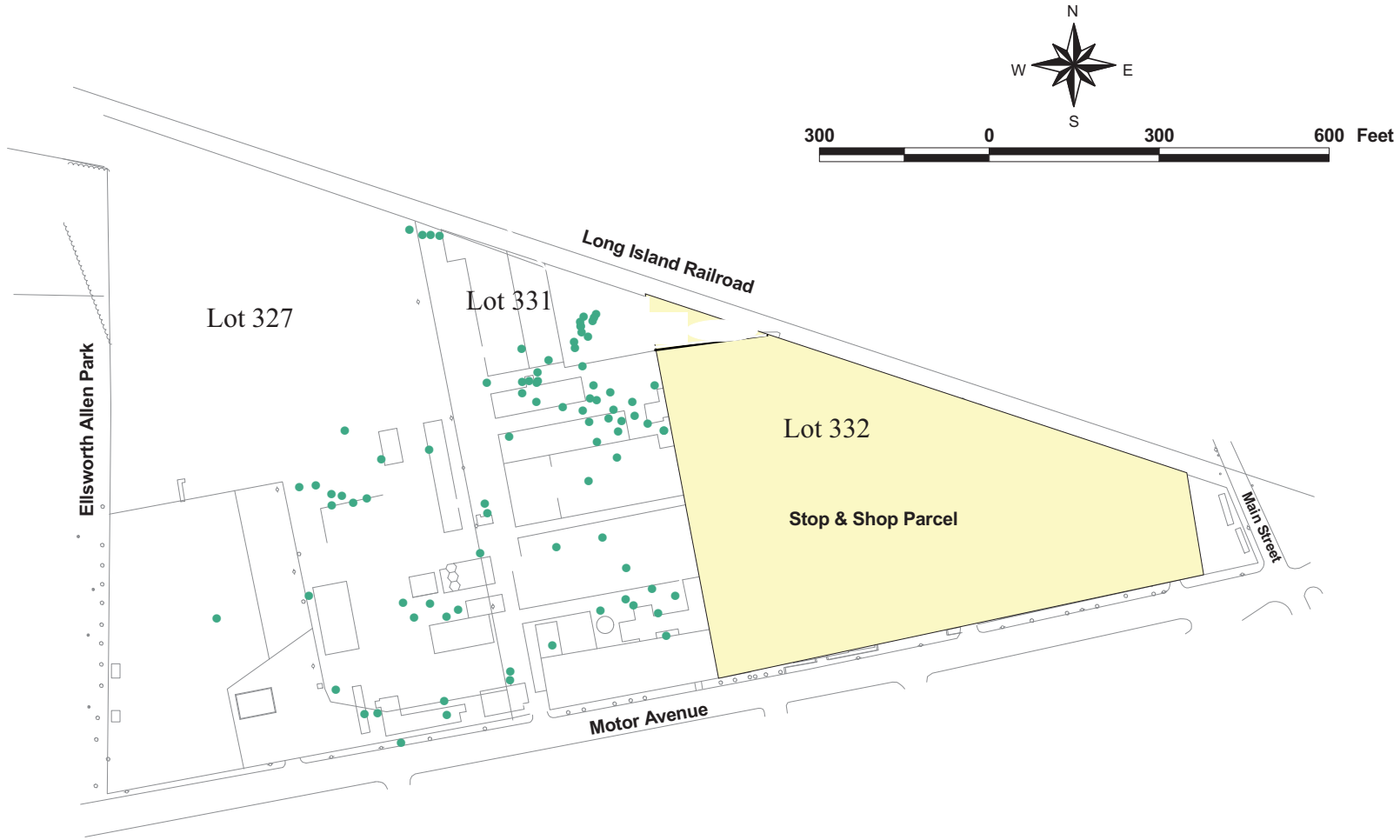


Figure 6 - Phase I Demolition Area & Western Parcel and Central Parcel Subsurface Features Location Map

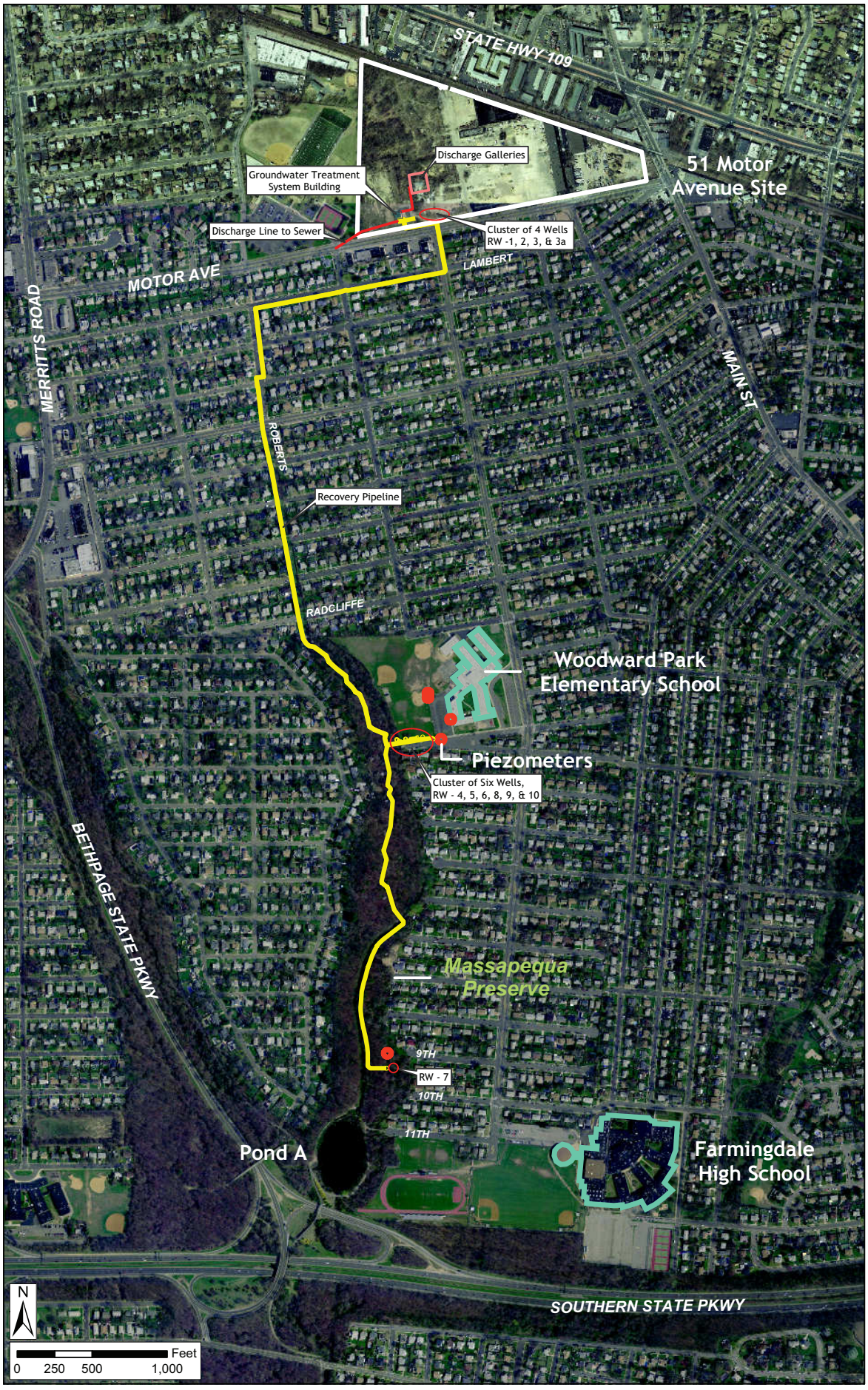
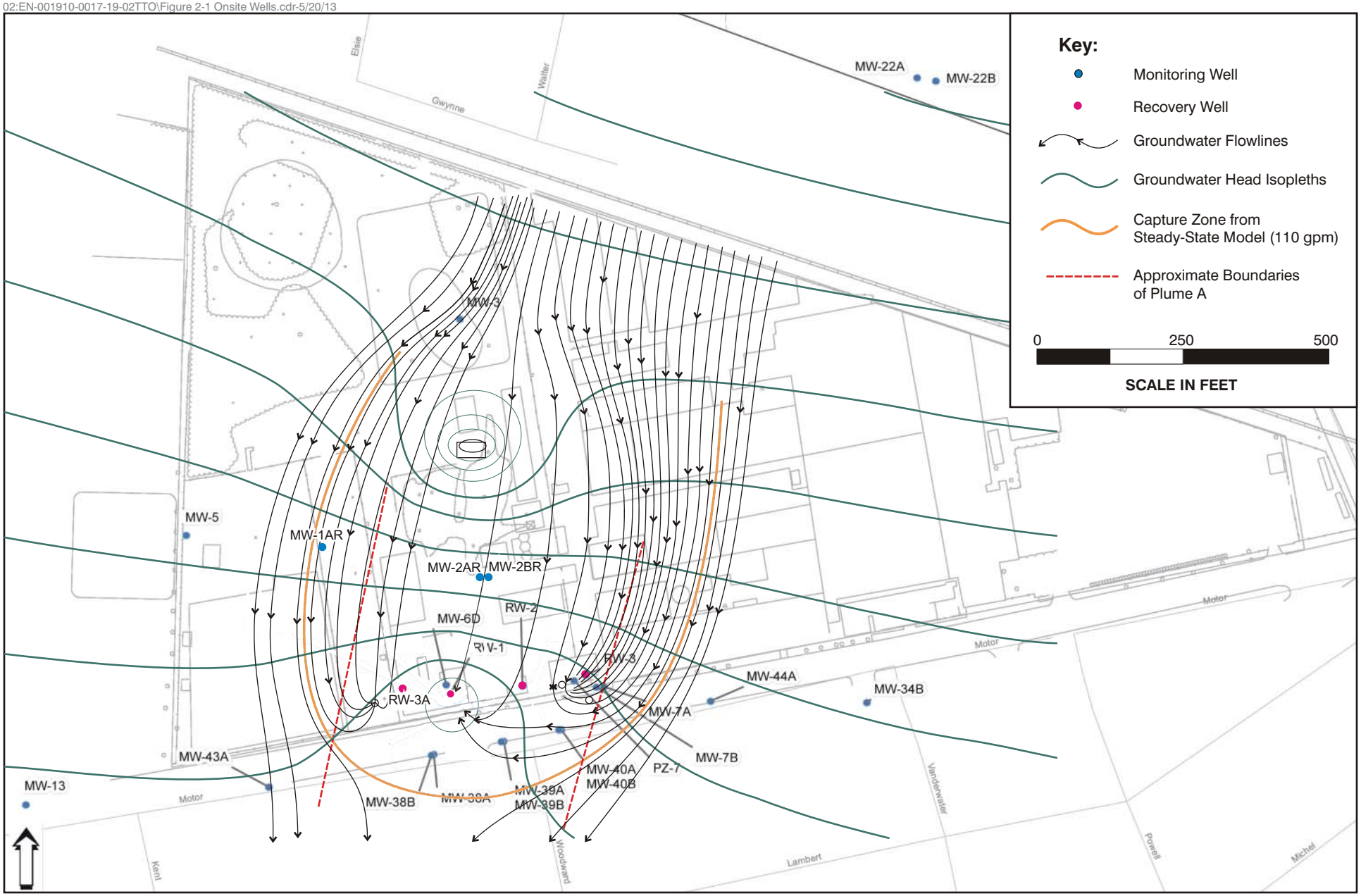


Figure 7 - Groundwater Remediation System's On-Site and Off-Site Construction Activities Layout



F-3

Figure *8* - Modeled Horizontal Capture Zone for On-site Recovery Wells

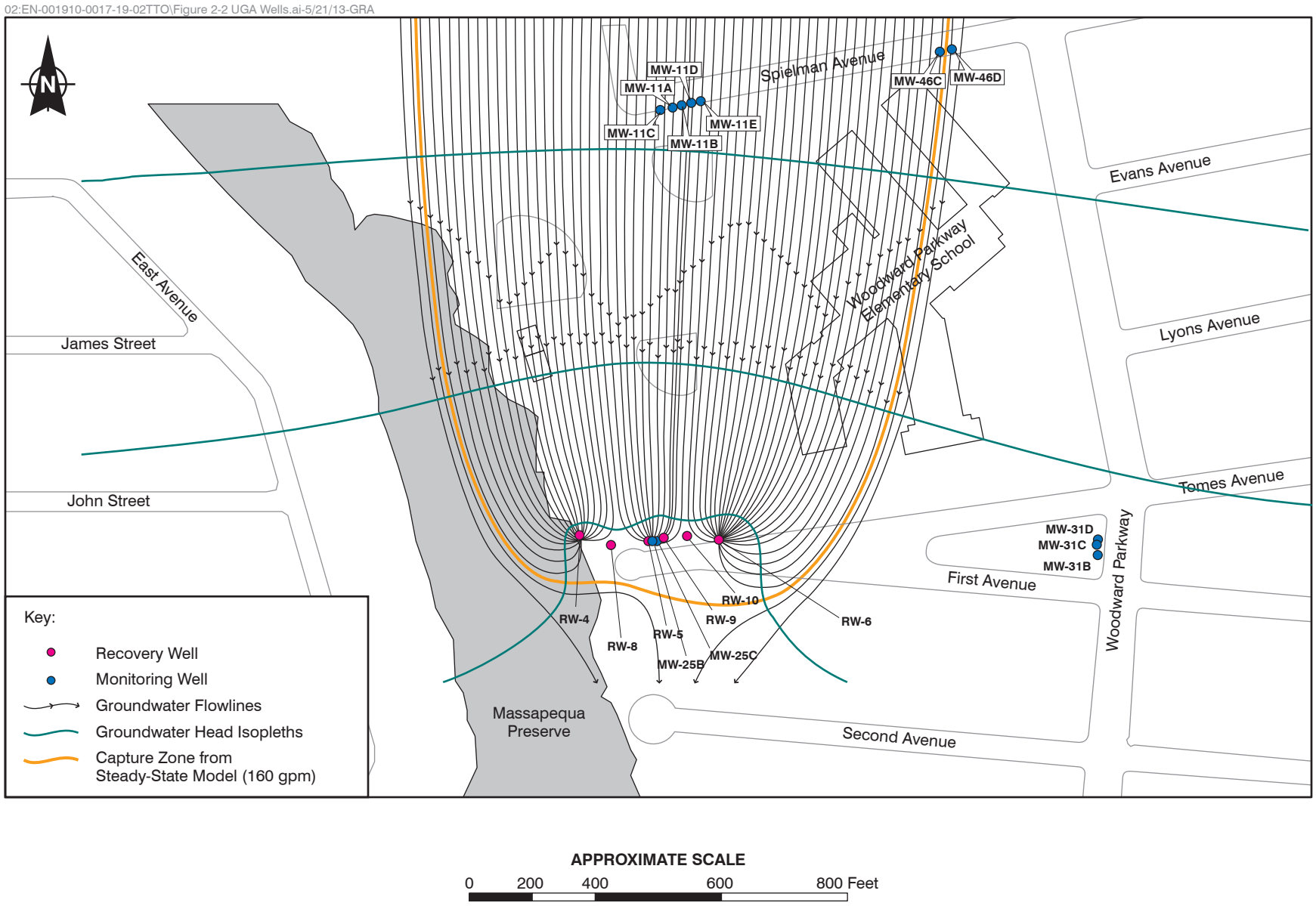


Figure 9 **Modeled Horizontal Capture Zone for Off-site UGA Recovery Wells, Liberty Industrial Finishing Site**

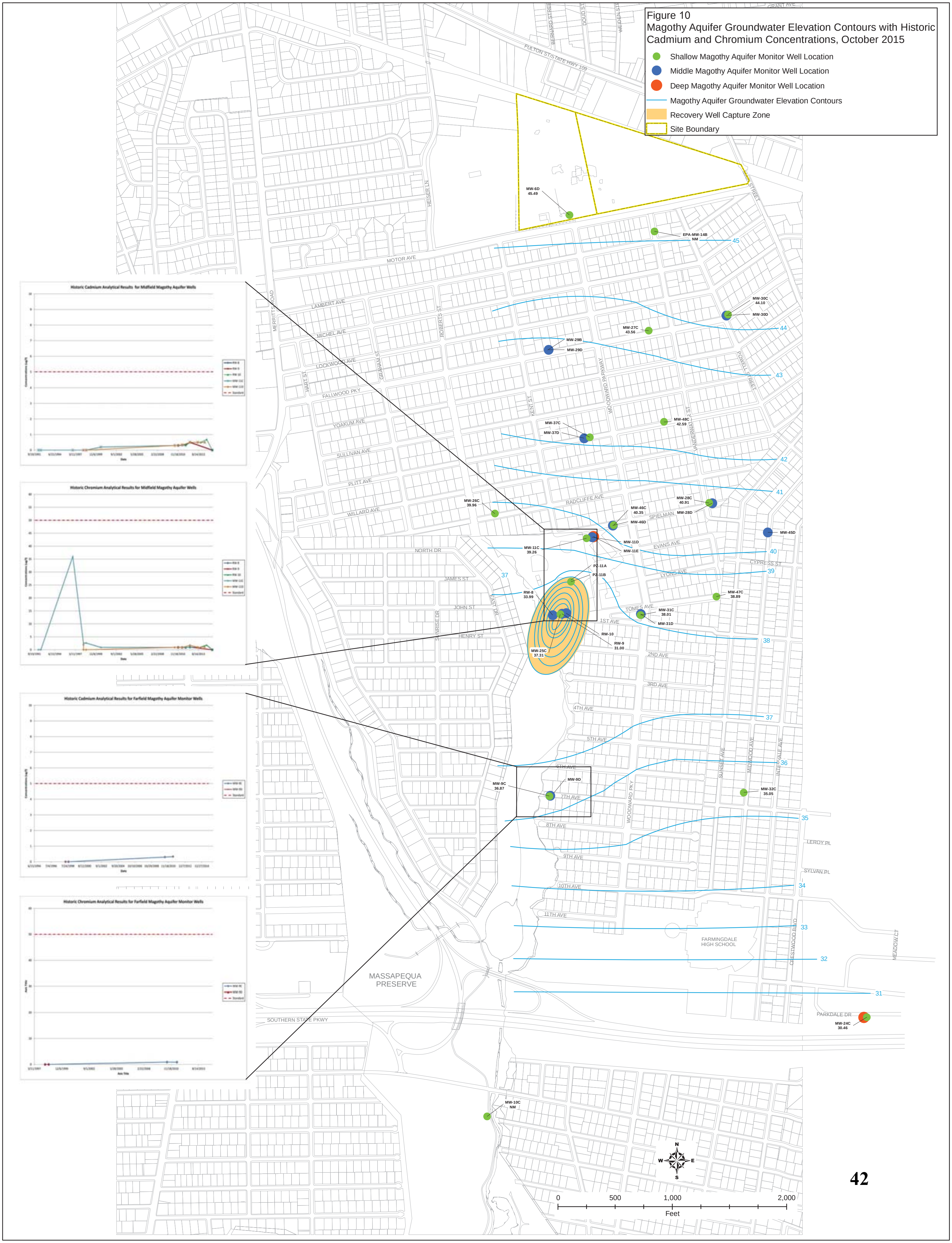


Figure 10
Magothy Aquifer Groundwater Elevation Contours with Historic Cadmium and Chromium Concentrations, October 2015

Figure 11 - Historic Cadmium Analytical Results for Onsite Recovery Wells

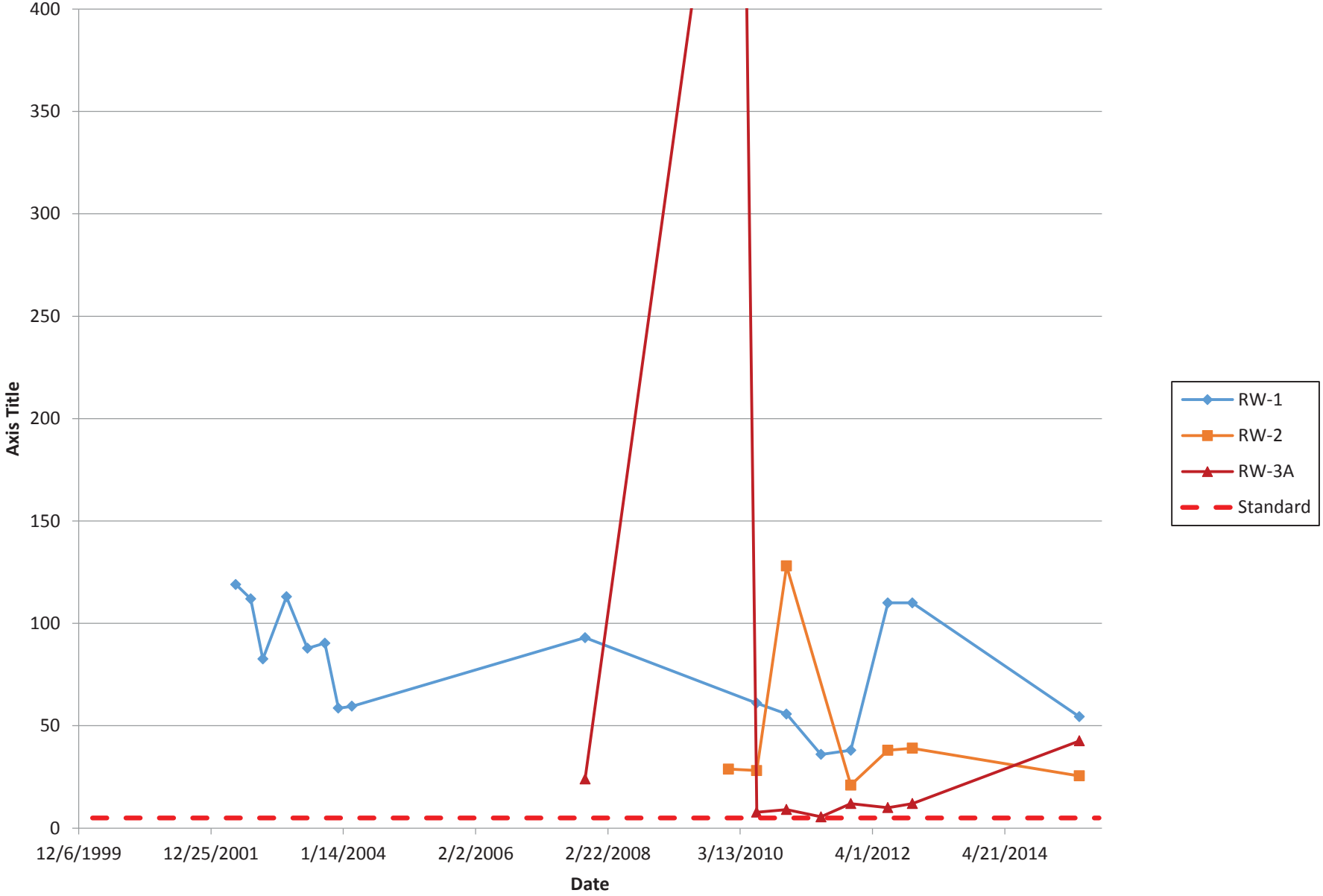
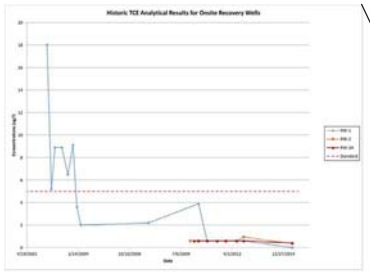
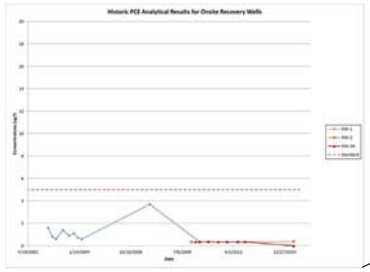


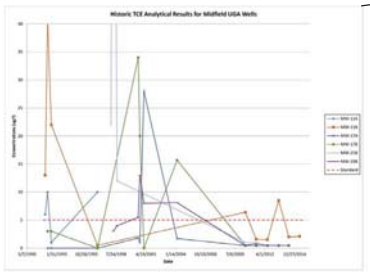
Figure 12 - Historic Chromium Analytical Results for Farfield Wells

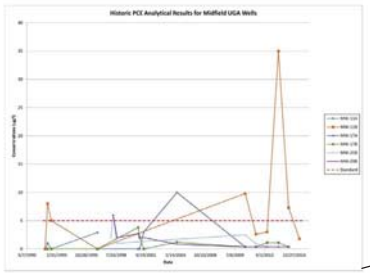
Figure 13
Upper Upper Glacial Aquifer Groundwater Elevation Contours with Historic Trichloroethene and Tetrachloroethene Concentrations, October 2015

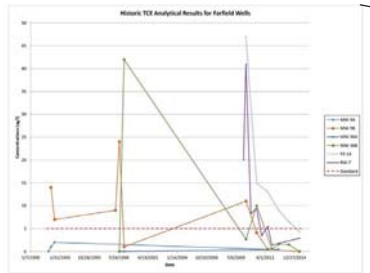
- Upper Upper Glacial Aquifer Monitor Well Location
- Lower Upper Glacial Aquifer Monitor Well Location
- Upper Upper Glacial Aquifer Groundwater Elevation Contours
- Site Boundary

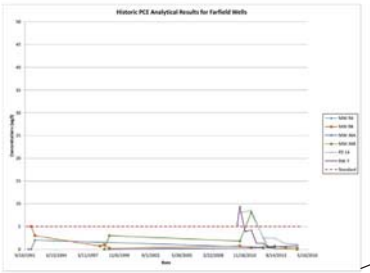


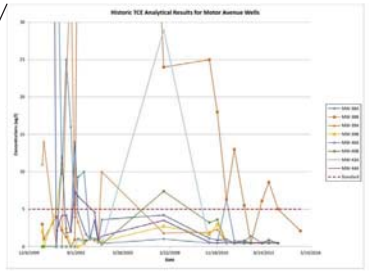


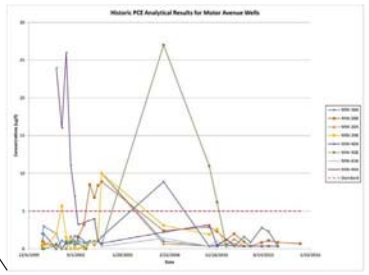












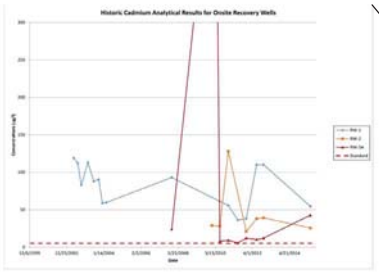
MW-3 47.40
PZ-17
PZ-15
PZ-18
PZ-16
MW01AR 45.82
MW02AR 45.97
RW-3 46.33
MW-1 44.70
MW-5 46.67
RW-2 45.70
MW-7A 45.46
RW-3A 45.49
MW-41AR 45.11
MW-41A 44.74
MW-34B
MW-38A 44.92
MW-40A 45.14
MW-44A 46.10
MW-39A 45.02
MW-14 43.49
MW-29B
MW-15 42.72
MW-17A 40.99
MW-17B
MW-11A 40.51
MW-11B
RW-4 NM
RW-6 39.50
RW-5 38.72
MW-25B
MW-9A 31.69
MW-9B
RW-1 31.98
MW-16
MW-19 33.89
MW-36B
MW-36A 33.49
MW-10A NM
MW-10B

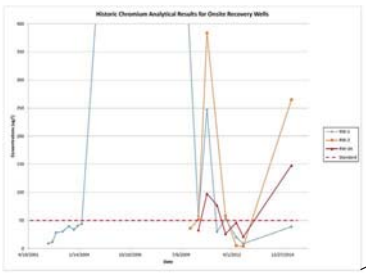
MOTOR AVE
LAMBERT DR
MICHEL AVE
FALLWOOD PKY
YODRUM AVE
SULLIVAN AVE
PLITT AVE
WILLARD AVE
NORTH DR
JAMES ST
JOHN ST
HENRY ST
TOMES AVE
EVANS AVE
LYONS AVE
SPELMAN AVE
BARCLIFF AVE
LYDIA ST
1ST AVE
2ND AVE
3RD AVE
4TH AVE
5TH AVE
6TH AVE
7TH AVE
8TH AVE
9TH AVE
10TH AVE
11TH AVE
WOODWARD PKY
LEROY BL
SYLVAN BL
PARKDALE DR
SOUTHERN STATE PKWY
MASSAPEQUA PRESERVE
FARMINGDALE HIGH SCHOOL

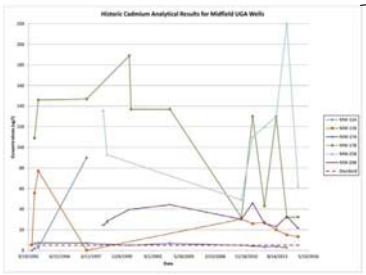
0 500 1,000 2,000
Feet

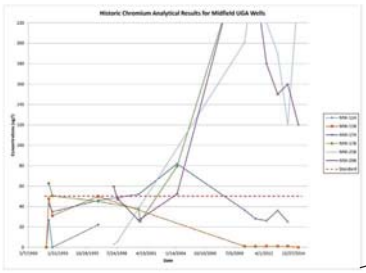
Figure 14
Upper Upper Glacial Aquifer Groundwater Elevation Contours with Historic Cadmium and Chromium Concentrat ons, October 2015

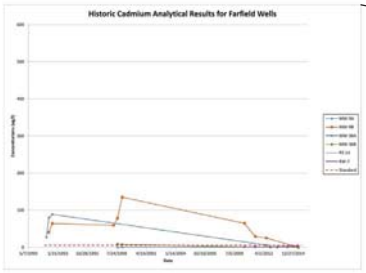
- Upper Upper Glacial Aquifer Monitor Well Location
- Lower Upper Glacial Aquifer Monitor Well Location
- Upper Upper Glacial Aquifer Groundwater Elevation Contours
- Site Boundary

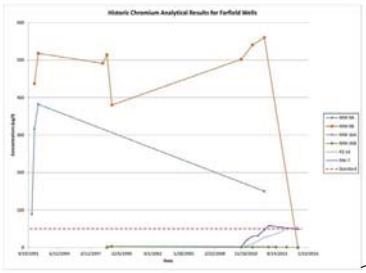












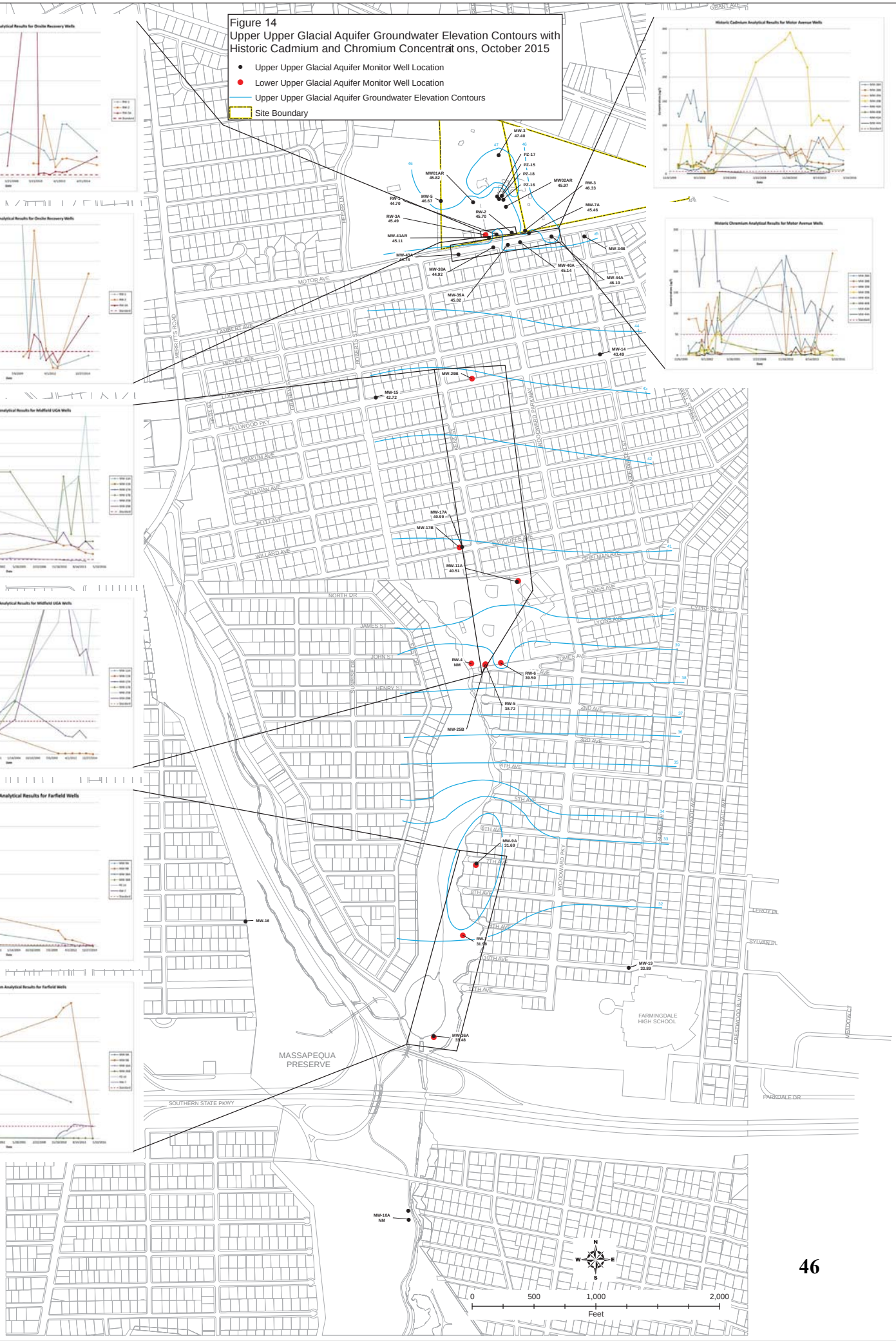


Figure 15 - Historic Cadmium Analytical Results for Motor Avenue Wells

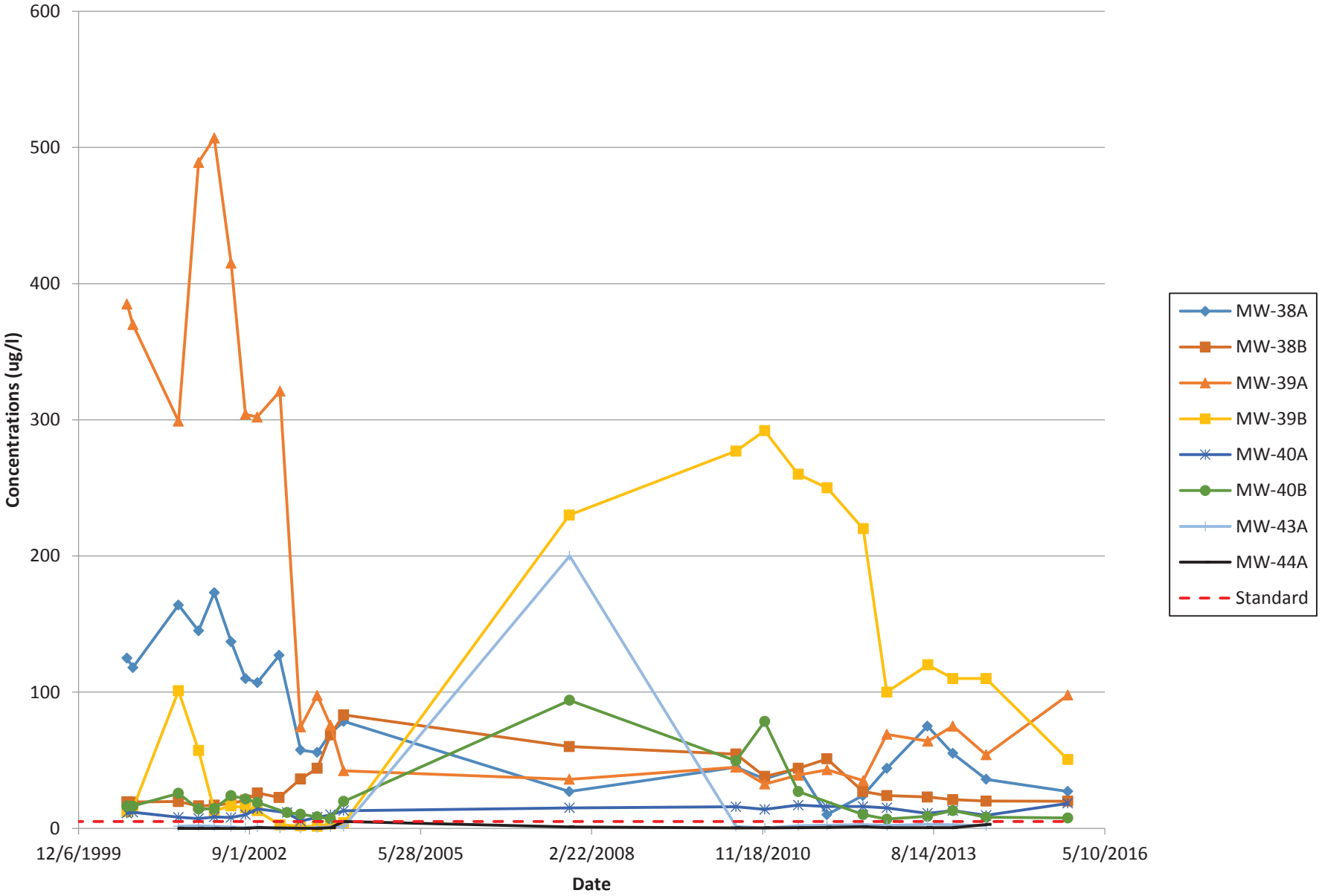


Figure 16 - Historic Chromium Analytical Results for Motor Avenue Wells

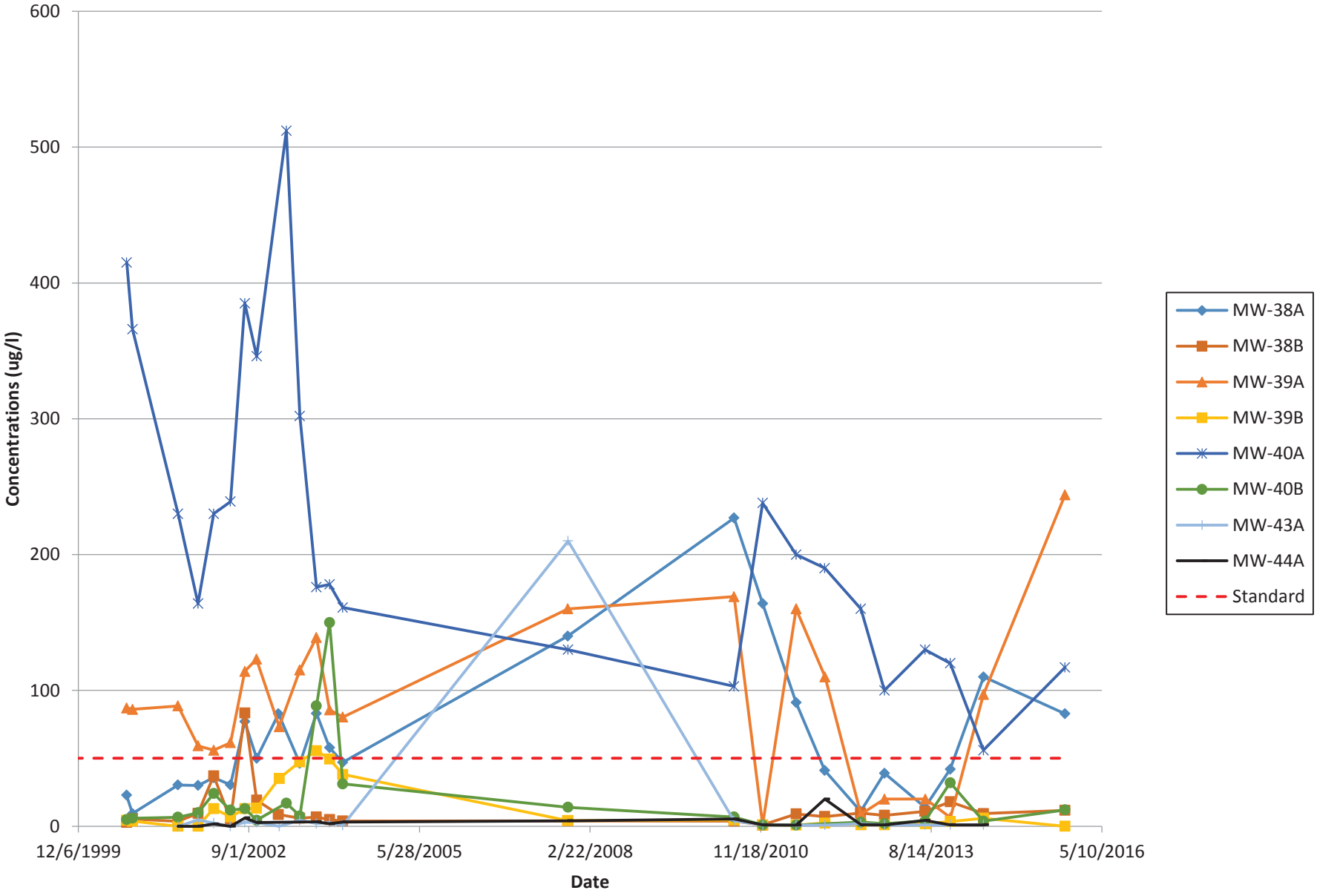


Figure 17 - Historic TCE Analytical Results for Midfield Magothy Aquifer Wells

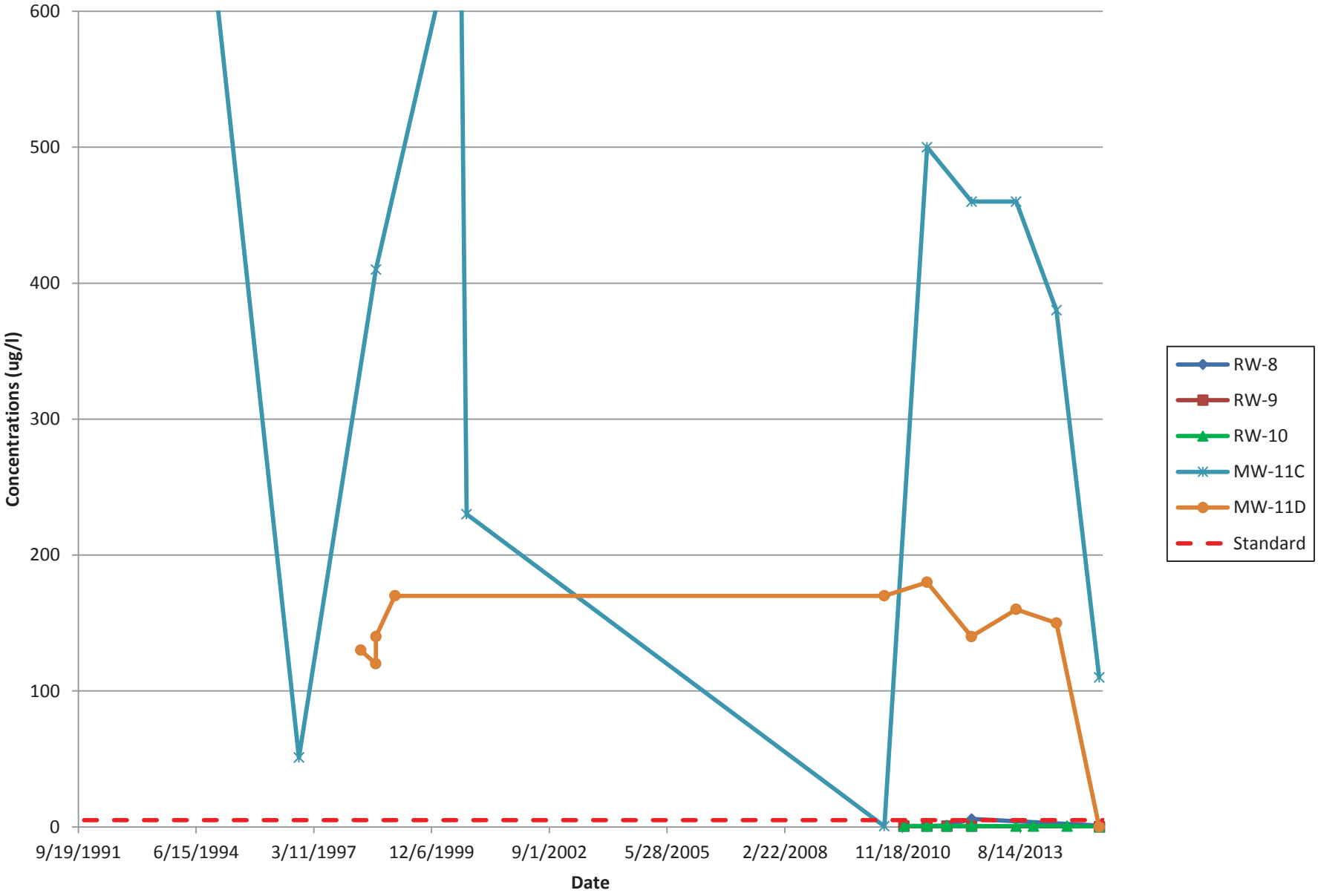


Figure 18 - Historic Cadmium Analytical Results for Midfield UGA Wells

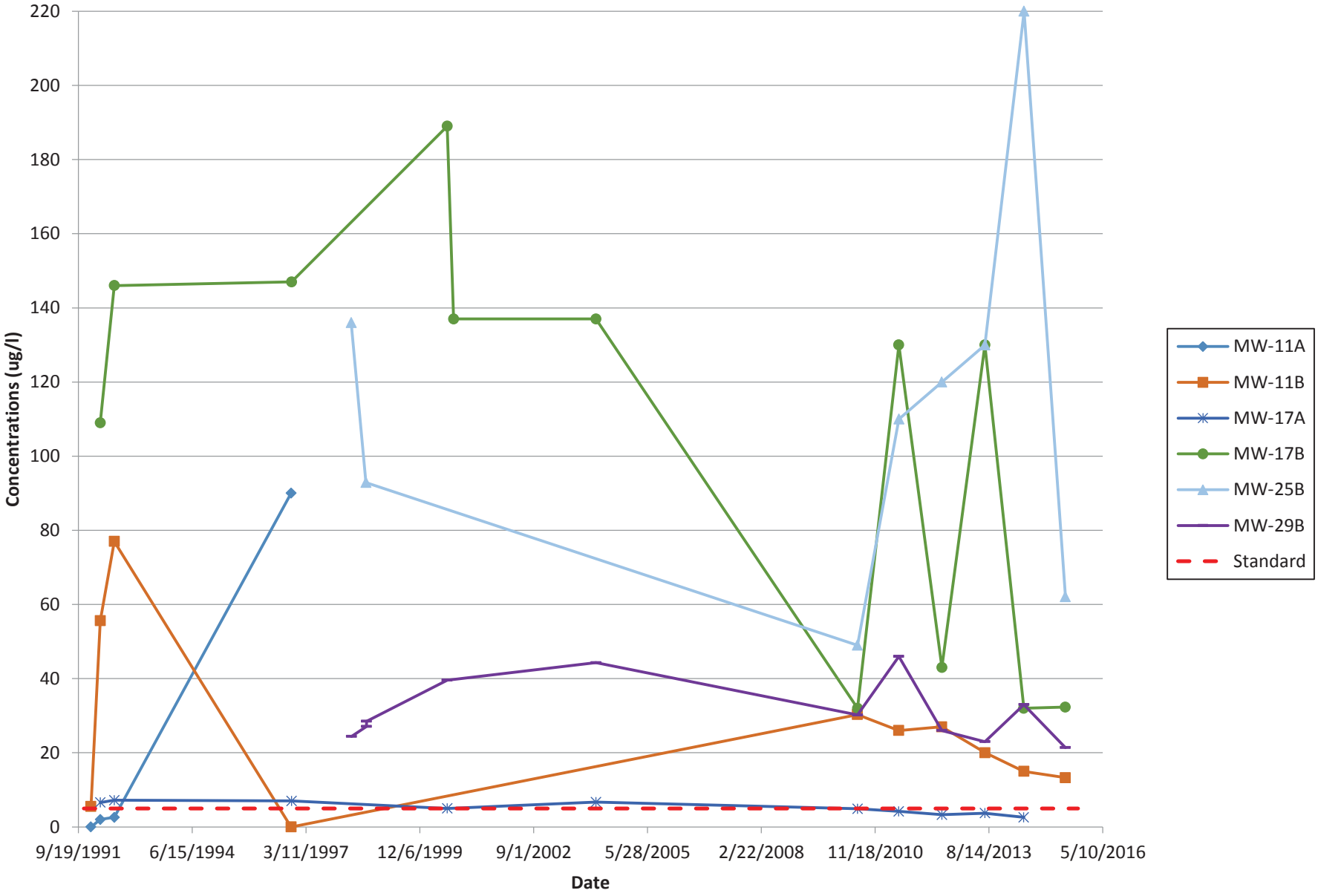


Figure 19 - Historic Cadmium Analytical Results for Farfield Wells

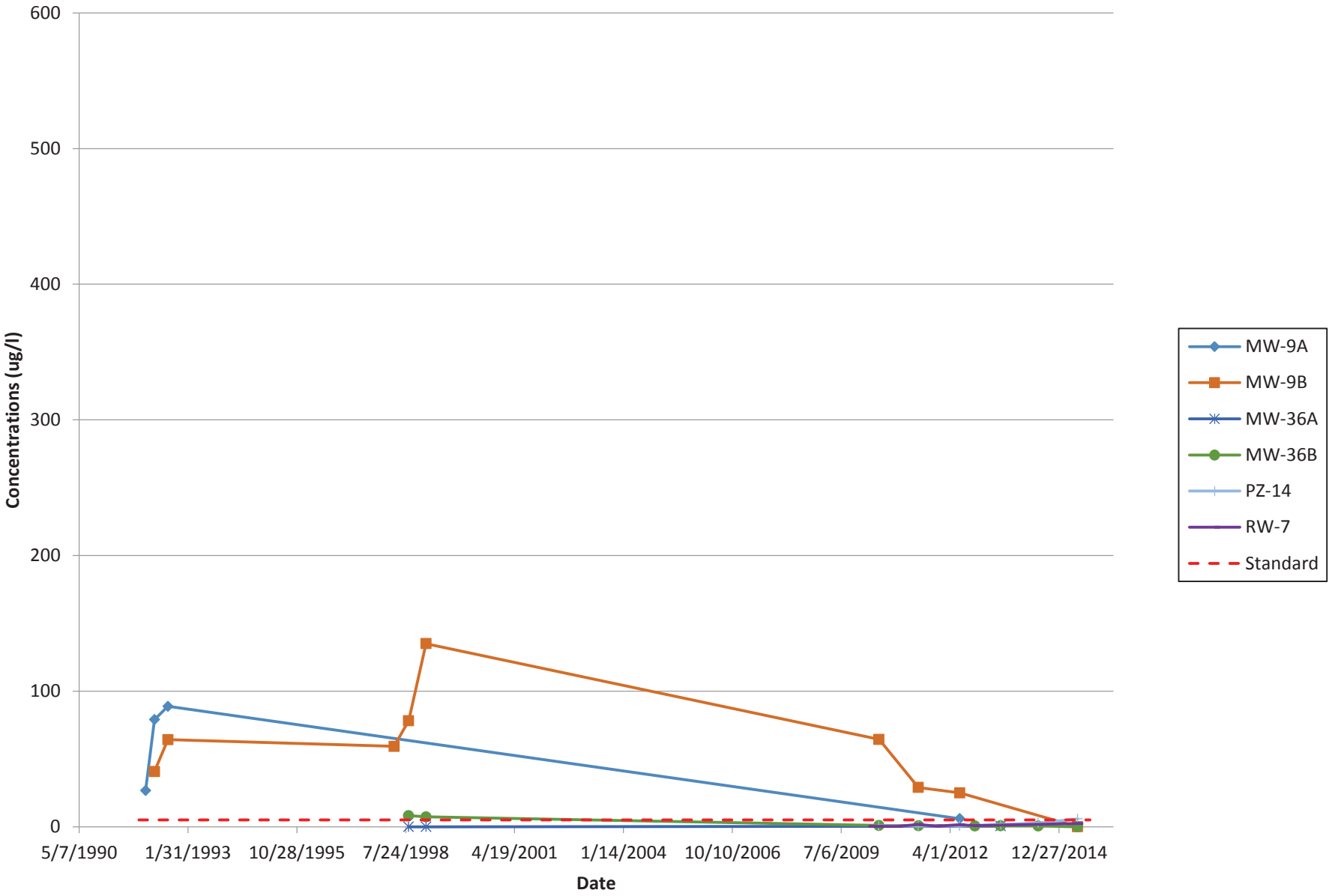


Figure 20 - Historic Chromium Analytical Results for Farfield Wells

APPENDIX D-REMEDIAL INVESTIGATION SUMMARY

APPENDIX D-REMEDIAL INVESTIGATION SUMMARY

Soils

The Initial Remedial Investigation (RI) and the Supplemental RI confirmed several significant on-property source areas including the former Wastewater Disposal Basins, the former Building B Basement area, the former Building B Ramp Pile, and the Northwest Disposal Area (see **Appendix D - Figure 1**). This figure shows Tax Lot 327 and former 15-acre Tax Lot 326 which is now Tax Lots 331and 332.

The Initial RI sampling did not fully characterize the extent of soil contamination. Therefore, a comprehensive soil sampling program was conducted in the western portion and part of eastern portion of the Site as part of the Supplemental RI to fully delineate the horizontal and vertical extent of contamination. Leachability testing was also conducted to derive soil cleanup levels for cadmium and chromium that would be protective of the underlying groundwater aquifers. These levels were established at concentrations of 10 milligrams/kilogram (mg/kg) of cadmium and 143 mg/kg of chromium, which are more restrictive than the health-based levels that EPA typically uses for contact under a residential use exposure scenario. Based on NYSDEC Technical and Administrative Guidance Memorandum (TAGM), the following soil cleanup objectives were adopted for VOC contaminants: 0.7 mg/kg of TCE, 0.25 mg/kg of cis-1,2-DCE, and 1.4 mg/kg of PCE.

Inorganic sampling results indicated that the former Wastewater Disposal Basins, the former Building B Basement area, the Northwest Disposal Area, and the former Building B Ramp Pile represented the major on-property source areas with cadmium and chromium concentrations in excess of their respective soil cleanup levels; outside these source areas, cadmium and chromium were also detected, in scattered locations, in concentrations above their respective soil cleanup levels. Also, analytical sampling results using the Toxicity Characteristic Leaching Procedure (TCLP) established that soils in the Northwest Disposal Area, the former Building B Basement area, and the former Building B Ramp Pile were hazardous wastes as defined by the Resource Conservation and Recovery Act (RCRA).

VOC contamination was detected in a very few soil samples. TCE was detected above soil cleanup objectives in samples collected within the vicinity of the former Building B Basement, with concentrations as high as 5.09 mg/kg. Only two other soil samples (collected from locations immediately south of the former Wastewater Disposal Basins and near the northwest corner of former Building N) had VOC concentrations above soil cleanup objectives with TCE concentrations of 1.17 and 0.78 mg/kg, respectively. Also, it was found that the VOCs are, in general, co-located with soils that also have cadmium and chromium concentrations above their respective soil cleanup levels.

Soil sampling results demonstrated that approximately 95% of the contaminated soils that exceeded above-mentioned soil cleanup levels were located on the western 15-acre portion of the Site property (e.g., the former Wastewater Disposal Basins, the former Building B Ramp Pile, and the Northwest Disposal Area); the balance of the soil contamination was situated on the eastern 15-acre portion of the Site (e.g., the Building B Basement area and the Building G floor drain).

Subsurface Features, Underground Storage Tank (UST) and Storm Drain Investigations

As part of the Supplemental RI, various subsurface features, underground storage tanks and the County storm drain on Motor Avenue in front of the Liberty Industrial property were investigated.

The subsurface feature investigation and sampling program was undertaken to identify the contents of various sumps, vaults, drains, or other on-Site subsurface containment features that were located on the eastern portion of the Site and to determine whether any of these features represented continuing sources of groundwater contamination. Sampling results indicated that the features did not represent significant sources of VOC or metals contamination to groundwater. However, the results did identify two semivolatile organic compounds (SVOCs), namely, benzo[a]pyrene and dibenz[a,h]anthracene, in concentrations as high as 0.041 milligrams/liter (mg/l) and 0.007 mg/l, respectively, in several of the subsurface features. These SVOCs did not present a potential threat to groundwater due to their limited mobility and low concentrations within the concrete subsurface features but would present a risk to future Site workers who may come in contact with these substances.

The UST investigation was conducted to evaluate suspected locations of five tanks to determine if the tanks contained hazardous liquids such as waste solvents or PCB-bearing waste oils. Two of the five tanks were not deemed to be of concern. The remaining three tanks could not be accessed due to safety considerations and inaccessibility, but they were investigated and remediated as part of the soil and subsurface feature remedial action.

Groundwater

An extensive groundwater investigation was conducted to evaluate the nature and extent of groundwater contamination, in particular Plume A, in both the UGA and the MA. RI sampling results indicate that two distinct plumes, Plume A and Plume B, exist beneath the property. As stated above, Plume A originates on the western portion of the Liberty property, while Plume B originates upgradient of the Site, northeast of Plume A. Plume A is characterized by TCE concentrations (including degradation products such as cis-1,2-DCE) coming mainly from the former Building B Basement area and the former Wastewater Disposal Basins and extending south-southwest (generally west of Woodward Parkway). There is no significant PCE concentration in Plume A. Plume A is also characterized by chromium and cadmium contamination. Plume B is characterized by PCE concentrations (including degradation products) and extends across the Site toward the south-southwest (generally east of Woodward Parkway). Unlike Plume A, Plume B is not characterized by chromium and cadmium contamination.

Sediment

The Initial RI revealed that the Liberty groundwater contaminant plume within the UGA discharges into Massapequa Creek north of Pond A. The County storm sewer system, to which the on-Site storm drainage system is connected, also discharges into the headwaters of Massapequa Creek. The six ponds (Ponds A, 1, 2, 3, 4, and 5, from upstream to downstream) located along the Massapequa Creek corridor are about 1 to 4 feet deep and were constructed to control localized flooding and silting of the streambed (see **Appendix D - Figure 2**). The conceptual model of Site contamination based upon the RI indicates that these ponds serve as detention basins for runoff and associated sediments entering the creek from the watershed. Pond A, being located furthest upstream and closest to the Site property, therefore had the greatest potential to be affected by contaminated groundwater discharge from the Site property. This information indicated the need to expand the limited investigation of the Massapequa Creek that was initially conducted during the RI.

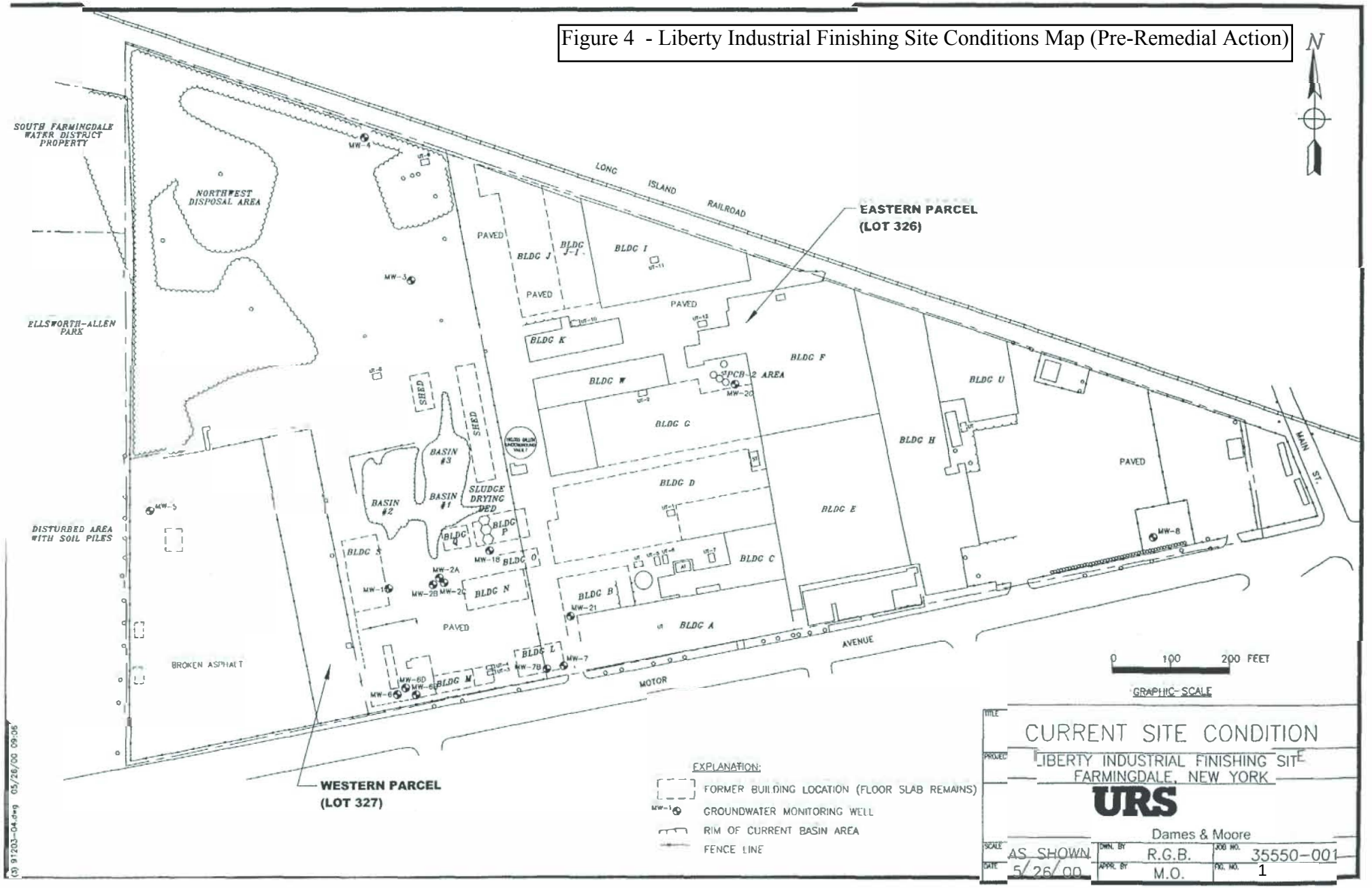
The objective of the Supplemental RI was to further define the extent of groundwater plume discharge, and to evaluate potential ecological effects in an ecological risk assessment.

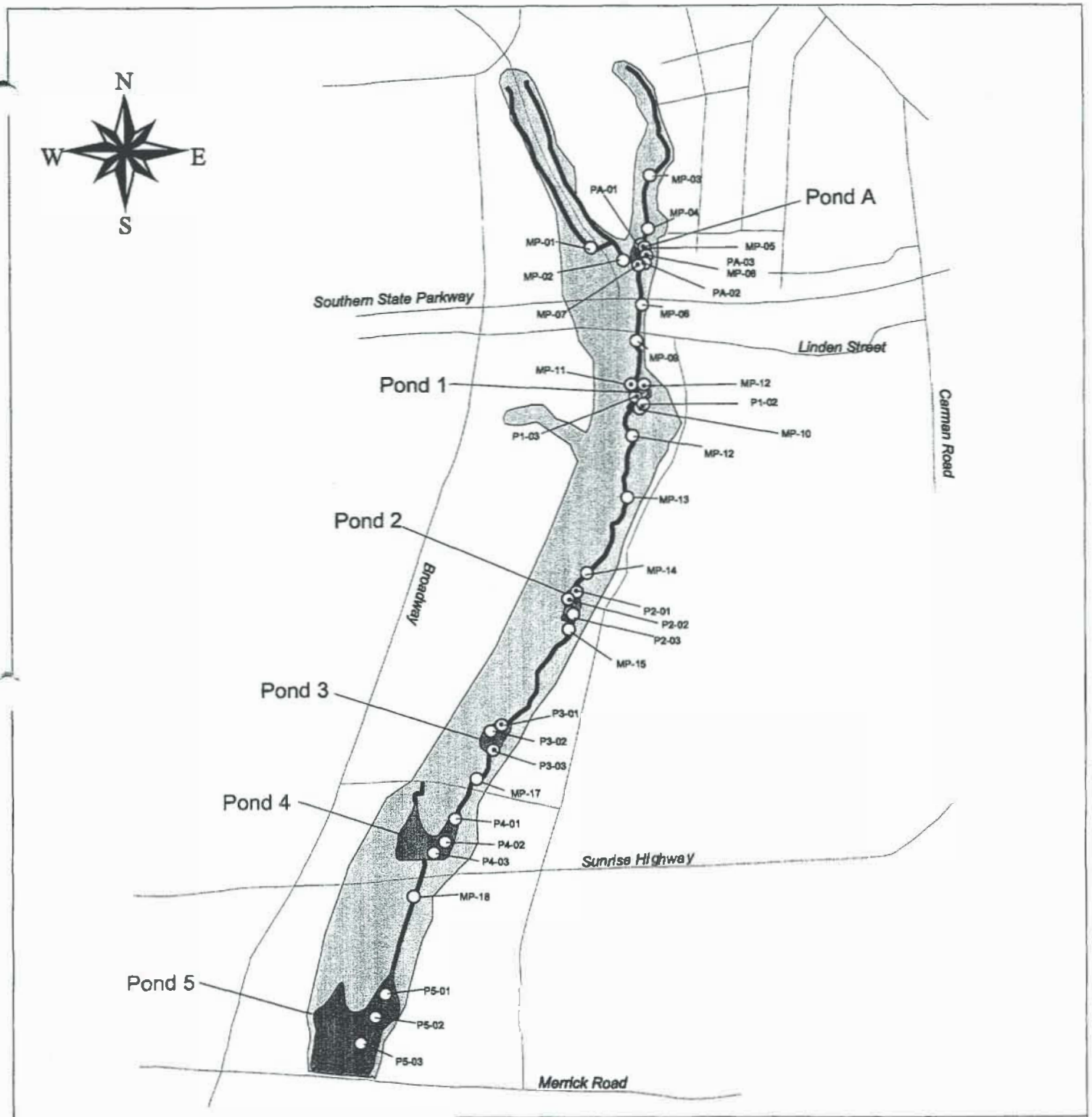
Water samples were collected from 13 locations within the Massapequa Creek system and analyzed for VOCs and cadmium, chromium and lead. The samples were collected between the

eastern branch headwaters of Massapequa Creek and just south of Pond 2. Results indicated only trace concentrations of VOCs in the surface water samples, none above the NYSDEC chronic ambient water quality standards (AWQS). Cadmium was detected above the NYSDEC chronic AWQS between Pond A and Pond 1 and above the NYSDEC acute AWQS upstream of Pond A; cadmium concentrations to the south of Pond 1 were either nondetectable or below the AWQS. Total chromium concentrations were below the NYSDEC AWQS throughout the study area. These results are compatible with overall characteristics of shallow groundwater discharge into the Massapequa Creek.

Five rounds of stream sediment and pond sediment sampling were conducted, though not all locations were sampled in each round. Metal concentrations in stream sediments were lower (by about two orders of magnitude) than the metals concentrations in pond sediments. The metals data were compared to NYSDEC guidance values used to screen contaminated sediments for possible adverse ecological impacts. Cadmium concentrations, which exceeded the NYSDEC Severe Effect Level (SEL) sediment screening guideline (9 mg/kg) in all ponds except the reference pond (Mill Pond), were highest in Pond A and Pond 1. Chromium concentrations also exceeded the NYSDEC SEL sediment screening guideline (110 mg/kg) in all ponds except the reference pond; chromium concentrations were highest in Pond A, Pond 1, and Pond 4.

Figure 4 - Liberty Industrial Finishing Site Conditions Map (Pre-Remedial Action)





O Sampling Location

0 2000 4000 6000 Feet

Massapequa Preserve Surface Water, Sediment, and Fish Tissue Sampling Locations

LIBERTY INDUSTRIAL FINISHING SITE
FARMINGDALE, NEW YORK

URS/Dames & Moore

AS SHOWN	M.O.	35550-001
7/19/00	M.O.	Figure 2