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RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES HELD 10 APRIL 2014  
CALVERTON COMMUNITY CENTER NWIRP CALVERTON NY  
4/10/2014  
RESOLUTION CONSULTANTS

**RESTORATION ADVISORY BOARD MEETING  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), CALVERTON  
CALVERTON COMMUNITY CENTER, CALVERTON, NEW YORK  
THURSDAY, APRIL 10, 2014**

The fortieth meeting of the Restoration Advisory Board (RAB) was held at the Calverton Community Center. Meeting attendees included representatives from the Navy (James Tarr and Jennifer Wright), New York State Department of Environmental Conservation (NYSDEC) (Henry Wilkie), New York State Department of Health (Steven Karpinski), RAB Community Members (Lou Cork, Vincent Racaniello), legislative representatives (Al Krupski [Suffolk County Legislature, First District] and Adam Santiago [on behalf of Timothy Bishop, New York First Congressional District]), Town of Riverhead (Chris Kempner), North Fork Environmental Council (Bill Toedter), Riverhead News Review (Tim Gannon), Resolution Consultants (Robert Forstner, Michael Zobel), Tetra Tech (David Brayack), and H&S Environmental (Jennifer Good, Al Taormina). The sign-in sheet is included as Attachment 1.

**WELCOME AND AGENDA REVIEW**

The Navy representative, Mr. James Tarr, welcomed everyone to the RAB meeting and introduced the meeting agenda. The agenda for the meeting is included as Attachment 2. The Navy presentations are included in Attachment 3.

**COMMUNITY UPDATE & DISTRIBUTION AND APPROVAL OF MINUTES**

Due to lack of a quorum of RAB members, there was no community update provided and approval of the minutes from the November 7, 2013 RAB meeting was deferred until a future meeting.

**TECHNICAL PROGRESS – GENERAL OVERVIEW OF INSTALLATION RESTORATION SITES AND SITE 2 GEOPHYSICAL INVESTIGATION UPDATE**

Mr. Tarr then introduced the technical portion of the meeting, which will consist of presentations on the current activities at Sites 2, 6A/10, 7 and the Southern Area. Some general information was provided first, including noting that the Five-Year Review for the site was complete and awaiting final signatures, the Fence-Line Treatment System (FLTS) has been operational since October 9, 2013, additional wells and piezometers were being installed to support the OU3 remedy and monitor the performance of the FLTS, the Site 7 air sparging/soil vapor extraction system would be shut down for 2014, and additional investigation along the Peconic River had been completed.

Regarding Site 2, it was noted that additional excavations were being planned for 2014. Mr. Racaniello asked about schedule for the Site 2 work; Mr. Tarr indicated that a preconstruction meeting was scheduled for May 1, and the work itself would occur over the summer.

## **TECHNICAL PROGRESS – FENCE-LINE TREATMENT SYSTEM UPDATE**

Ms. Jen Good (H&S Environmental) provided an update on the operation of the Fence-Line Treatment System (FLTS). The presentation is included in Attachment 3. The FLTS was constructed pursuant to a Record of Decision (ROD) for Site 6A/10B that was completed in May 2012. The selected remedy calls for land use controls and a system to extract, treat and infiltrate groundwater in order to achieve the remedial goal of containing the spread of a plume of volatile organic compounds (VOCs) leaving the site in groundwater.

The FLTS system employs two extraction wells, air stripping equipment, and two infiltration galleries in order to control the VOC plume. Construction started in October 2012 and was completed in October 2013, and system start-up occurred on October 8, 2013. The start-up of the system included an initial 7-day continuous manned operation, with flow rates beginning at 85 gallons per minute (gpm) and increasing to between 95 and 100 gpm. Influent and effluent samples were collected during the initial seven-day start-up period, and throughout the remainder of the month, to evaluate system performance. Results indicate a VOC removal efficiency of 99 percent, and that discharge goals were being met.

In the following months after start-up, additional work at the FLTS included the completion of construction punch-list items. The flow rate was also temporarily reduced due to high injection well alarms caused by an elevated water table. Flow rates were reset to between 95 and 100 gpm in January 2014. The system was down for about 6 days in January 2014 as a result of damage to electrical relays caused by a power surge, but throughout February and March 2014 average flow rates exceeded 90 gpm. An increased frequency of bag filter changeouts was noted in February and March. A polyphosphate metering pump was added in April 2014, and additional sampling was performed for purposes of evaluating the impacts of bag filter changes versus polyphosphate addition on system performance. Mr. Racaniello inquired as to the cause of the fouling of the bag filters; Mr. Brayack noted that iron appears to be the cause, but it is not yet established whether this will be an ongoing issue. The preference was to minimize the usage of chemicals, but with bag filters requiring replacement on a weekly basis it was decided to introduce the polyphosphate.

Operating statistics and sampling data were then presented, covering the initial six month operating period. System uptime and flow rates were lower in the first four months due to issues described previously, but in February and March 2014 uptime exceeded 93 percent and average influent flowrates exceeded 91 gpm. Laboratory analyses show the system has consistently been achieving 99 percent or greater removal efficiencies for 1,1-dichloroethane (DCA), and for VOCs as a whole; VOC mass removal rates have ranged from 1.70 to 4.04 lbs/month, and a total of 19.26 lbs of VOCs had been removed through March 2014.

A summary of performance and future activities related to the operation of the FLTS was presented. Continued compliance with all discharge goals and VOC removal efficiencies greater than 99 percent are

the primary goals. Future activities include continuation of monthly compliance sampling and reporting, completion of an Operation and Maintenance Manual and a Construction Completion Report, an evaluation of the use of polyphosphate in the treatment process, and hydraulic testing to determine long-term operational criteria for the system.

The presentation on the FLTS concluded with a slide depicting the presumptive capture zone. Mr. Brayack noted that a pump test will be completed to confirm that capture zone, and monitoring of system performance will continue throughout operation. With the source areas having already been addressed, it is expected that VOCs in influent to the FLTS will decrease within a couple of years.

An inquiry was made as to the pumping rate, and the depth of the plume. Mr. Brayack responded, noting that the extraction wells extend down to the confining layer at a depth of about 50 feet. Mr. Tarr added that the pumping rate is expected to average about 3.2 million gallons per month, and that through March 2014 about 19 million gallons had been pumped. Regarding a question as to how long the system will need to operate, Mr. Brayack noted that two to four years is a minimum estimate. Mr. Racaniello asked about monitoring near the infiltration galleries. Mr. Brayack indicated that in addition to existing wells and piezometers already in the vicinity of the infiltration galleries, new piezometers are being installed for the express purpose of monitoring the FLTS.

Mr. Gannon asked if the FLTS is the primary means of performing the site cleanup. Mr. Brayack responded, indicating that the FLTS is meant to address the site contamination and that ongoing monitoring will be used to make sure that it is achieving that goal. Asked about what primary contaminants were, Mr. Brayack noted that jet fuel, DCA, 1,1,1-trichloroethane (TCA) and chloroethane were the primary contaminants; the petroleum products don't have a tendency toward mobility, but the chlorinated VOCs do tend to flow with the groundwater.

#### **TECHNICAL PROGRESS – SITE 7 REMEDIAL ACTION UPDATE**

Mr. Brayack (Tetra Tech) provided an update on the status of the air sparging / soil-vapor extraction (AS/SVE) system at Site 7 (the former Fuel Depot). The presentation is included in Attachment 3. A summary of the site history was provided first, noting that the AS/SVE system started operation on a pilot scale in 2005 and at full scale in 2006, and was operated seasonally (April to December) through November 5, 2013. Modifications have been made over time to improve performance, but the system is near the end of its functional life, with a major blower overhaul required to continue operation.

There was some discussion about the history of monitor wells southwest of Site 7 proper that have been impacted by Freon; Mr. Brayack noted that this area was being treated by the AS/SVE system through wells added during an optimization that took place about two years ago. In response to a question about the depth of the contamination, Mr. Brayack further elaborated that the hydrocarbon contamination is

generally at the top of groundwater (about 15 feet below the ground surface), but there has been some smearing as a result of seasonal fluctuation in the water table.

Site data over time was presented that indicates the majority of site groundwater has achieved remedial goals, as indicated by contaminant concentrations reaching goals at 20 of 27 monitor well locations. The remedial goals for soils were then summarized. It was noted that remedial goals specified in the ROD were originally developed based on NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) 4046, but that this guidance has since been superseded by remedial goals specified in Part 375 of NYSDEC's regulations; the target concentrations are generally consistent, but some close-out goals will need to be updated.

A description of the path forward followed. It was noted that the Navy was not operating the system in 2014, but was continuing quarterly groundwater sampling to evaluate site behavior and determine whether a system overhaul and resumption of operations in 2015 is warranted. Future action will be driven primarily by an evaluation of groundwater quality data being collected throughout 2014, when the system will not be operating. This data will determine whether the system should be restarted in 2015 and, if so, what modifications to the system may be needed. Soil sampling would also be conducted to verify that contaminant levels are sufficient to protect groundwater prior to site close-out.

Mr. Racaniello observed that the condition of the AS/SVE equipment should not dictate whether the system is shut down or restarted. Mr. Brayack suggested that emphasis on the condition of the blowers was misplaced; indeed, the 2014 groundwater quality data will be the primary driver in determining next steps. Ms. Wright asked for clarification on the historic shutdown periods for the AS/SVE system; Mr. Brayack confirmed that the shutdowns were seasonal, typically from December through April.

Mr. Toedter inquired as to what coordination has taken place with the Town of Riverhead re Site 7. Mr. Brayack suggested that ultimately the land may be transferred to the Town, possibly with land use controls as a requirement, but that wouldn't be established until it's been determined that the site can be closed out. If a land transfer takes place before remediation is completed, covenants defining limits on future land uses and requirements for continuing remedial actions would typically be included; the transfer of Site 10A was cited as an example of how this might be accomplished. In any case, the Navy would not be able to transfer the land before any required remedial system was in place. As a follow-up, Mr. Krupski inquired as to who controls the process going forward. Mr. Brayack confirmed that the Navy will determine the disposition of the property; if a transfer occurs before remedial goals are complete, the Navy would still retain liability for all Navy-related contamination. Mr. Gannon asked if the long-term plan was still to turn the site over to the Town; Mr. Brayack confirmed that this is the goal.

## **TECHNICAL PROGRESS – 2013 PECONIC RIVER INVESTIGATIONS**

Mr. Brayack continued with a summary of investigations conducted along the Peconic River in 2013. The presentation is included in Attachment 3. The objective of the 2013 Peconic River investigation was to determine whether a portion of the Site 6A – Southern Area plume of DCA is flowing beside or beneath the Peconic River downriver of Connecticut Avenue and south of the east runway. Activities included the installation of five soil borings to the clay unit for lithology, five temporary wells (each with nine to 12 water samples) for the collection of groundwater samples and 12 piezometers to evaluate groundwater flow, as well as three rounds of water level measurements.

Analytical results did not indicate evidence that the Site 6A – Southern Area plume has migrated to this area. Similarly, a flow-net analysis of groundwater flow patterns suggests that the existing conceptual site model was correct, and that groundwater flows above the clay layer horizontally to the Peconic River and then discharges into the river. There is no evidence to suggest site contaminants are crossing to the south side of the river.

Some discussion of the results followed. Mr. Krupski asked if these results were expected; Mr. Brayack confirmed that they were, but that other possibilities could not be discounted without completing this study.

## **TECHNICAL PROGRESS – 2013 GROUNDWATER INVESTIGATION**

Mr. Robert Forstner (Resolution Consultants) provided a presentation on the status of the 2013 groundwater investigation, and results from that investigation. The presentation is included in Attachment 3. Sampling in 2013 was a continuation of the basewide program conducted in 2011 and 2012, and included surface water, sediment and groundwater sampling at four locations along the Peconic River in May and September, and a full round of groundwater sampling at 73 locations (including the four Peconic River piezometers) in September. Groundwater samples were collected from locations at Site 2 (16 locations on-property, including two new locations installed in 2013, and seven locations off-property), Site 6A/10B (12 locations, including six new wells that were installed in 2013) and the Southern Area (20 locations on-property and 22 locations off-property, including seven off-property locations in the Peconic River area).

All samples (groundwater, surface water and sediment) were analyzed for volatile organic compounds (VOCs); three groundwater samples were also analyzed for iron, manganese and arsenic. For the results maps shown in the presentation and the accompanying detail maps, the abbreviation “ND” was employed to indicate that a given compound (or VOCs as a group, if appropriate) was not detected. Bolded results indicate that a compound exceeded a relevant standard (such standards include the New York State Department of Health [NYSDOH] maximum contaminant level [MCL] for groundwater, NYSDEC surface water quality standard for surface waters, and Oak Ridge National Laboratory chronic toxicological value

or NYSDEC Technical Guidance for Screening Contaminated Sediments value for sediment). Detections of the primary site contaminants (e.g., DCA and TCA) were identified on the maps regardless of concentration relative to the standards. The abbreviation "NX" was used to denote samples where at least one VOC other than a primary site contaminant was detected, but that such detection(s) did not exceed a relevant standard.

Mr. Forstner first reviewed figures showing the flow of groundwater and analytical results for Site 2. Generalized groundwater flow data for Site 2 indicate flow is to the southeast, consistent with previous observations. The groundwater elevation in September 2013 was found to be approximately one-half to one foot lower than that observed in September 2012. Regarding groundwater quality, trichloroethene (TCE) was detected at concentrations exceeding the MCL at two new monitor wells installed in 2013 (FT-MW09I and FT-MW10I), but at concentrations less than 10 µg/L. The 2013 groundwater data for Site 2 were otherwise generally consistent with 2012 results, and no MCLs were exceeded at any other on-property locations and most off-property locations. To the south and east of Swan Pond, however, TCE exceeded its MCL at two locations. Of particular note was FT-PZ460I, where a concentration of 370 µg/L was detected, consistent with an "anomaly" that has been seen at this location since it was first sampled in February 2012. Other VOCs also exceeded MCLs at this location, including DCA, 1,1-dichloroethene (DCE), 1,2-DCE and tetrachloroethene.

Mr. Forstner then moved on to figures showing results at Sites 6A/10B and the Southern Area. First, a figure summarizing the overall contaminant plume extending from Sites 6A/10B and the subareas it is divided into for discussion purposes was shown for orientation purposes. Similar to the groundwater flow data for Site 2, groundwater at Sites 6A/10B and the Southern Area generally flows to the southeast. Water levels to the northeast were found to be approximately one foot lower in elevation in 2013 than in 2012, but in the vicinity of the Peconic River water elevations in 2013 were generally similar to those observed in 2012. The review of the groundwater chemistry data then proceeded by subareas:

- **Source Area (Sites 6A and 10B):** There was an increase in concentrations of several VOCs at FC-MW03SR1 (where six compounds exceeded their MCLs in 2013, as compared to two in 2012), and a decrease in overall VOC concentrations at FC-MW02SR1. Groundwater results in this area were otherwise generally consistent with results from 2012, and no VOCs exceeded an MCL at any other location. In addition, no MCLs were exceeded at any of six new wells that were installed in this area in 2013; locations FC-MW09S, I & I1 and FC-MW10S, I & I1 were installed in clusters on either side of the FC-MW05S & I and FC-PZ05I1 cluster in order to create a "fenceline" across which to measure the mass flux of VOCs moving downgradient from the source area.
- **Fence Line Area:** There are observable fluctuations at some locations (e.g., SA-PZ138I1, SA-PZ139, SA-PZ15I1). The trend has been towards decreasing concentrations of VOCs over the past several years at most locations, though concentrations in 2013 were generally of a similar

order of magnitude to those observed in 2012. VOCs at SA-PZ149I1, however, remained elevated after an increase first noted in 2012; for example, 1,1-DCA increased at this location from 12 µg/L in 2011 to 520 µg/L in 2012 and 630 µg/L in 2013. These fluctuations may be due to variations in groundwater flow driven by precipitation and infiltration, and will continue to be monitored using the existing well and piezometer network.

- **Offsite High Concentration Area:** Concentrations of several VOCs at SA-PZ142I remained about three times greater in September 2013 as compared to September 2011, but these concentrations were consistent with results from September 2012; for example, DCA at SA-PZ142I increased from 100 µg/L in 2011 to 290 µg/L in 2012 and 250 µg/L in 2013. Concentrations of DCA and DCE were otherwise stable or decreased in the Offsite High Concentration Area (in particular, DCA decreased from 69 to 28 µg/L at SA-PZ140I, and from 62 to 41 µg/L at SA-PZ145I).
- **Offsite Low Concentration Area:** The most notable change identified in this area was an increase in VOC concentrations at SA-MW132I, located at the edge of the delineated plume; TCA was not detected in September 2011, and detected at concentrations of 31 µg/L in September 2012 and 120 µg/L in September 2013. DCA and DCE also increased at this location over the same period. These increasing concentrations may be due to continued migration of contaminants from the Offsite High Concentration Area, and/or the result of a hydraulic block due to a potential reversed hydraulic gradient near Donahue Pond.
- **Peconic River Area:** DCA, DCE and TCA continue to be detected in excess of MCLs in shallow groundwater at SA-PZ124 (along the banks of the Peconic River), but concentrations decreased in September 2013 as compared to May 2013 and September 2012. DCA was detected in surface water at SA-SW124 in May and September 2013, and at SA-SW204 in September 2013 only; these results did not exceed standards, and were consistent with intermittent detections that have previously been reported. Concentrations of DCE and carbon disulfide slightly exceeded guidance values at SA-SD124 in at least one sample in 2013, but VOCs were otherwise not detected in Peconic River sediments.

Some discussion regarding the analytical data followed. Mr. Gannon asked if the Navy is claiming it is not responsible for the anomaly near FT-PZ460I; Mr. Brayack responded, noting that there was an investigation conducted previously where additional temporary wells were installed at various intervals stepping out from the anomaly, but that no sources could be identified. Mr. Tarr further elaborated, noting the existence of VOCs at this location appears to be stable, and that it will continue to be monitored.

Mr. Toedter inquired about the increasing concentration of VOCs at SA-MW132I, and whether further investigation is warranted. Mr. Brayack responded, noting that VOC concentrations at this location will continue to be monitored. If elevated levels persist or continue to increase, then a targeted investigation would be considered.

## **GENERAL DISCUSSION**

Following completion of the formal presentations, there was further discussion of the progress at the site in general. Mr. Toedter asked about the potential impacts of introducing large volumes of discharge water at the FLTS. Mr. Brayack clarified that the discharge did not represent an increase in the quantity of water flowing through the area; all of the water being infiltrated was also extracted from the same area, and so while there may be localized mounding of groundwater near the infiltration galleries there is no expectation that groundwater flow on a wider basis would be altered.

Mr. Toedter asked if there was any plan for long-term action in the Southern Area. Mr. Brayack responded, noting that a draft plan was submitted to the state and county to define action levels. Comments were expected and the project team was hoping to finalize that plan within months.

Regarding water issues on Long Island, Mr. Toedter further noted that any remedial actions by the Navy could have impacts to others' plans; for example, a fish ladder that is being planned for the Peconic River. Mr. Brayack observed that one of the reasons the RAB is so valuable is that it offers a chance for the project team to get feedback from the community and information about projects such as the fish ladder that are being undertaken by others.

Ms. Wright noted that it will be interesting to see the effects of the FLTS on VOC concentrations in the offsite areas. Mr. Brayack cautioned that it may take some years before the impact of the FLTS on the offsite areas will be seen due to the velocity at which the groundwater is moving; it may take five or more years before there's a notable impact near Donahue Pond, and perhaps seven to 10 years before water treated by the FLTS reaches the Peconic River.

Mr. Toedter also noted that there may be changes to the water balance in the area due to pending work related to the Town of Riverhead's wastewater treatment plant. Ms. Kempner (Town of Riverhead) noted that work is being done to improve the plant's discharge, upgrading the treatment level from secondary to tertiary. As part of that work, the discharge point would be moved to the opposite side of the drainage divide, which would have the effect of decreasing the net flow of groundwater through the site. Mr. Brayack suggested removing that the treatment plant's discharge from the water budget would not be of concern if the plant discharge was shifted to a different drainage basin, but if stormwater discharges were shifted to a different drainage basin the overall flow of groundwater could be reduced significantly. Ms. Kempner indicated she would keep the project team informed of upcoming changes to discharge locations and quantities.

## **CLOSING REMARKS**

Mr. Tarr thanked the attendees for their participation. The selection of a date for the next RAB meeting was deferred, pending identification of an alternative meeting location if the Calverton Community Center

is not available in November. The final date and location will be confirmed and communicated about one month prior to the meeting, which would likely be in early November 2014. The meeting was then adjourned.

**ATTACHMENT 1**

**APRIL 10, 2014 RAB MEETING SIGN-IN SHEET**

**40<sup>th</sup> RAB Meeting for NWIRP Calverton  
April 10, 2014  
Sign-in List**

Name (Print)	Address and/or email if interested in being on mailing list	Affiliation	How did you hear about the meeting?
Jim Tarr			
Al Tormann			
Jennifer Wright			
Jen Good			
Lou Cork			
David Brzozocki			
Steve Karpinski			
Mike Zabel			
Robert Forstner			
Al Krupski			
Bill Tedder			
Henry Wilkie			
Adam Santiago			
Vincent Racaputto			
Tim Gernish			

# **40<sup>th</sup> RAB Meeting for NWIRP Calverton April 10, 2014 Sign-in List**

**ATTACHMENT 2**

**APRIL 10, 2014 RAB MEETING AGENDA**

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## **Agenda**

### **Restoration Advisory Board Naval Weapons Industrial Reserve Plant Calverton**

**April 10, 2014  
Calverton Community Center, Calverton NY  
7:00 p.m.**

#### **Welcome and Agenda Review**

James Tarr CPG, NAVFAC Mid-Atlantic

#### **Distribution of Minutes**

All Members

#### **Community Update**

Bill Gunther, RAB Co-chair

#### **Technical Progress**

##### **General Overview of ER Sites**

James Tarr CPG, NAVFAC Mid-Atlantic

##### **Site 2 Munitions Response Update**

James Tarr CPG, NAVFAC Mid-Atlantic

##### **Fence Line Treatment System Update**

Jen Good PG, H&S Environmental

##### **Site 7 Remedial Action Update**

Dave Brayack PE, Tetra Tech

##### **Site 2 Off-Property Investigation**

Dave Brayack PE, Tetra Tech

##### **2013 Groundwater Investigation Summary**

Robert Forstner PE, Resolution Consultants

#### **Closing Remarks**

James Tarr CPG, NAVFAC Mid-Atlantic

*Presenters will be available after the program for questions.*

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**ATTACHMENT 3**

**NAVY PRESENTATIONS – APRIL 10, 2014 RAB MEETING**



## RESTORATION ADVISORY BOARD MEETING

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT  
(NWIRP) CALVERTON, NEW YORK

April 10, 2014

# General Overview of ER Sites

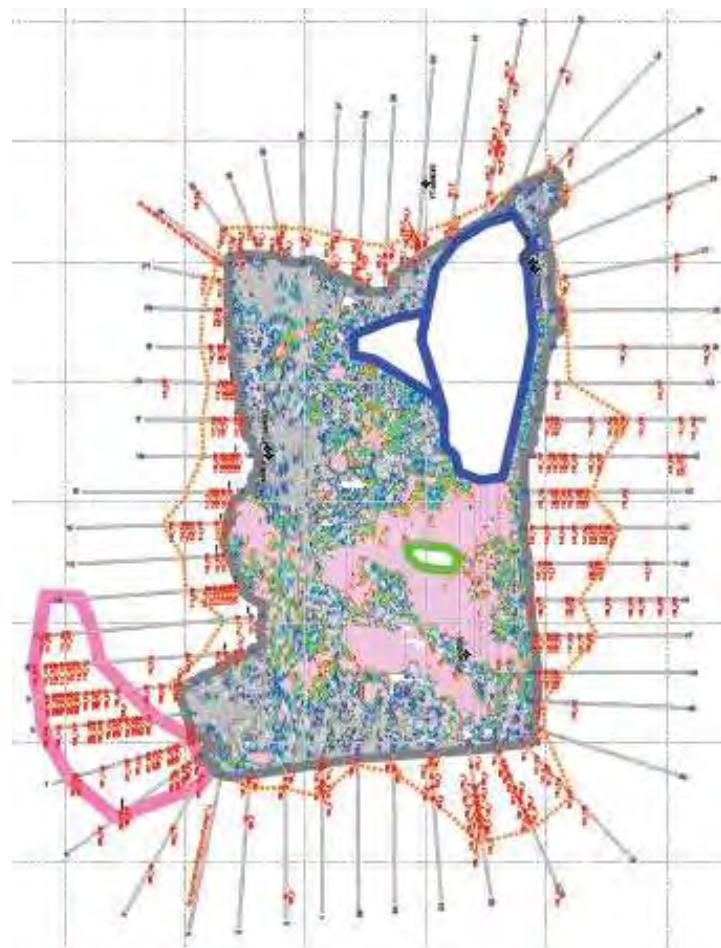


- Sitewide
  - 2013 annual sampling program completed in September
  - Five-year Review is final for signature
- Site 6A/10B
  - Fence-line system construction completed and online since October 9
  - Additional monitor wells installed to support OU3 remedy
- Site 7
  - Extraction system shutdown for 2014
- Southern Area & Off-Property
  - Additional investigation along Peconic River completed

# General Overview of ER Sites



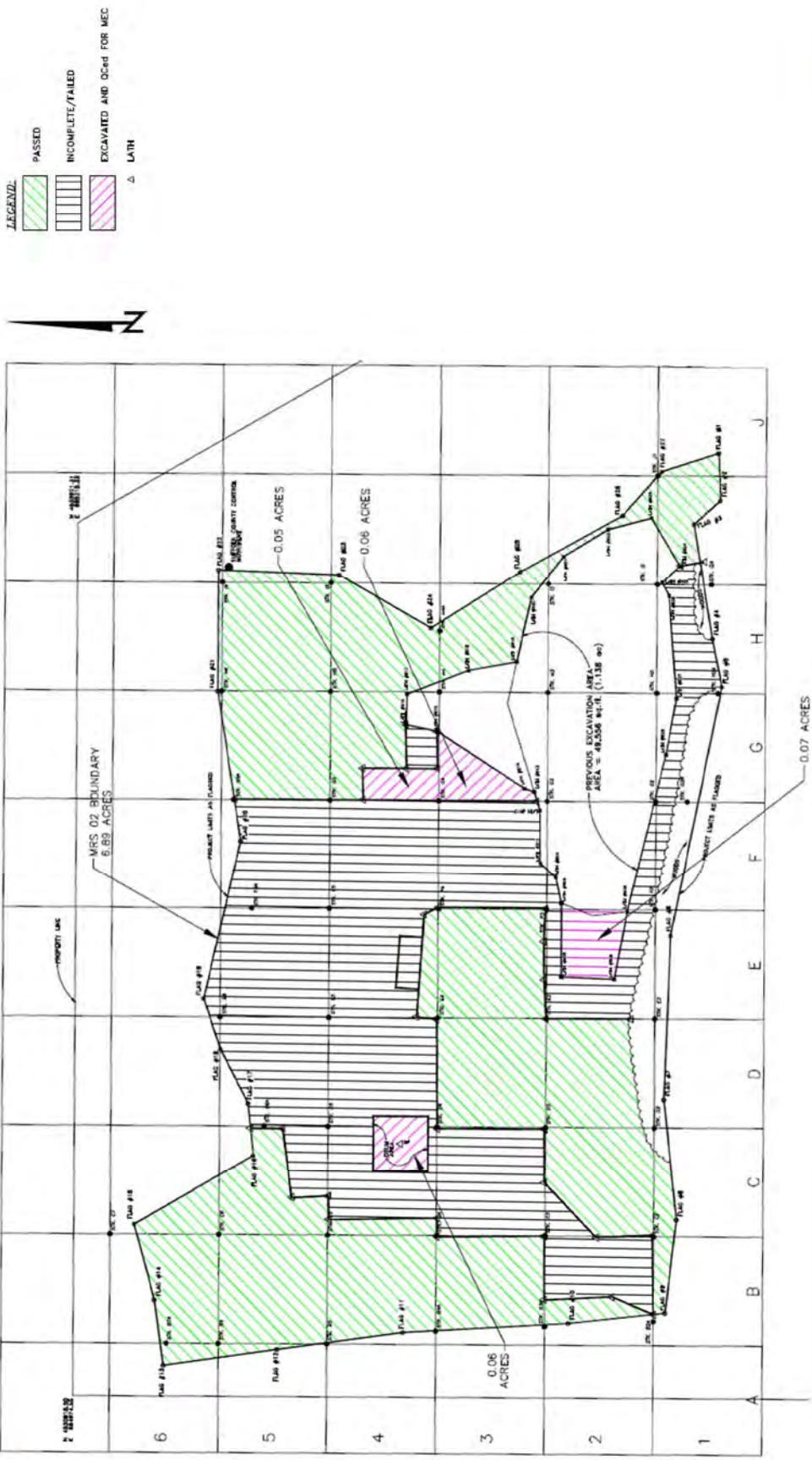
- Site 2
  - Additional environmental excavations planned Spring 2014
  - On-property and Off-property environmental investigation completed





## General Overview of ER Sites

## ■ Site 2





**SITE 6A - SOUTHERN AREA FENCE LINE GROUNDWATER  
EXTRACTION TREATMENT SYSTEM (FLTS)  
APRIL 2014 RESTORATION ADVISORY BOARD**

NWIRP CALVERTON  
LONG ISLAND, NEW YORK

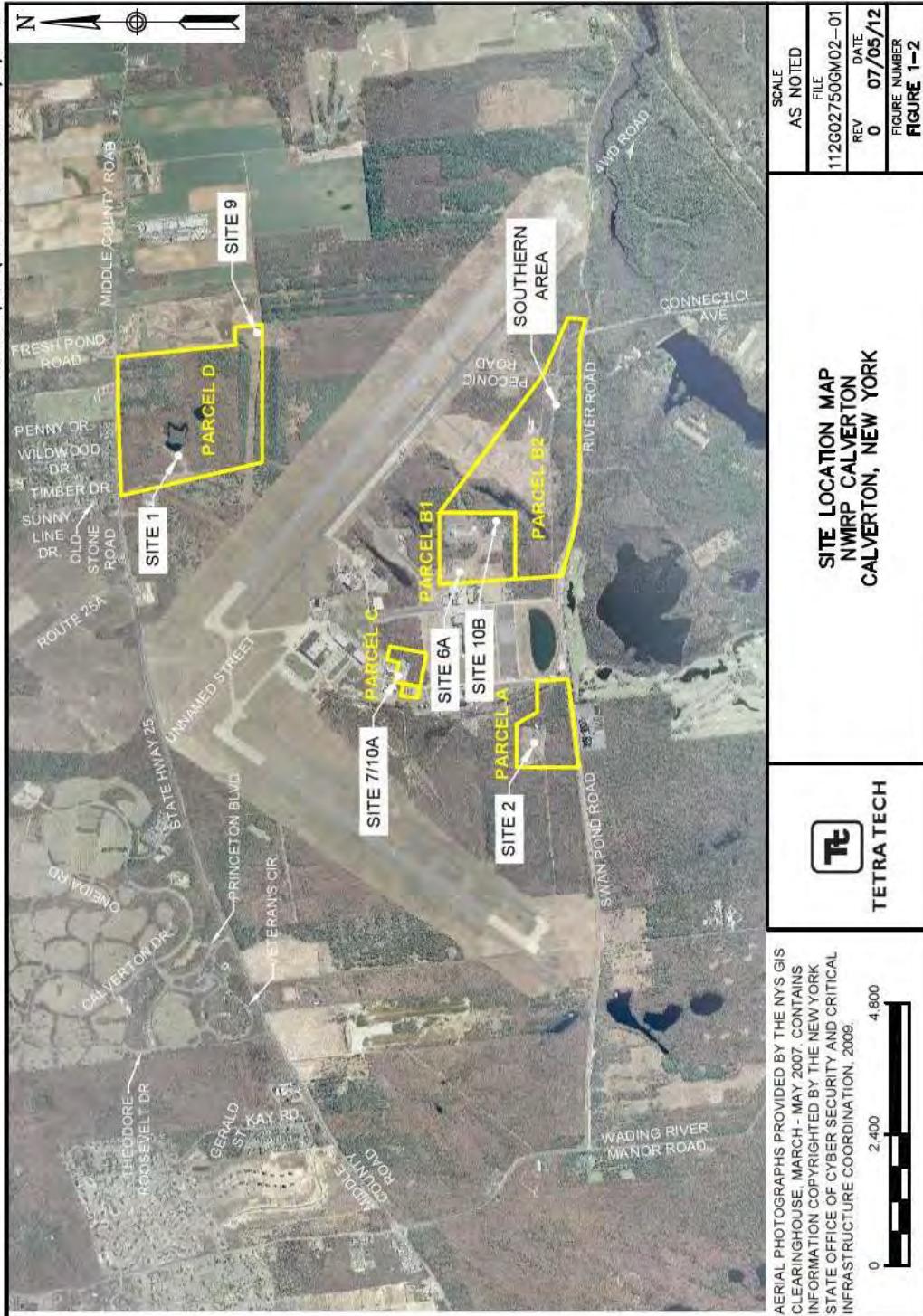
04/10/2014

# Presentation Agenda

- Introduction
- Design Overview
- Construction Summary
- Start-up and Continued System Performance
- Future Activities



# Site Layout



# Fence Line Treatment System Design Overview

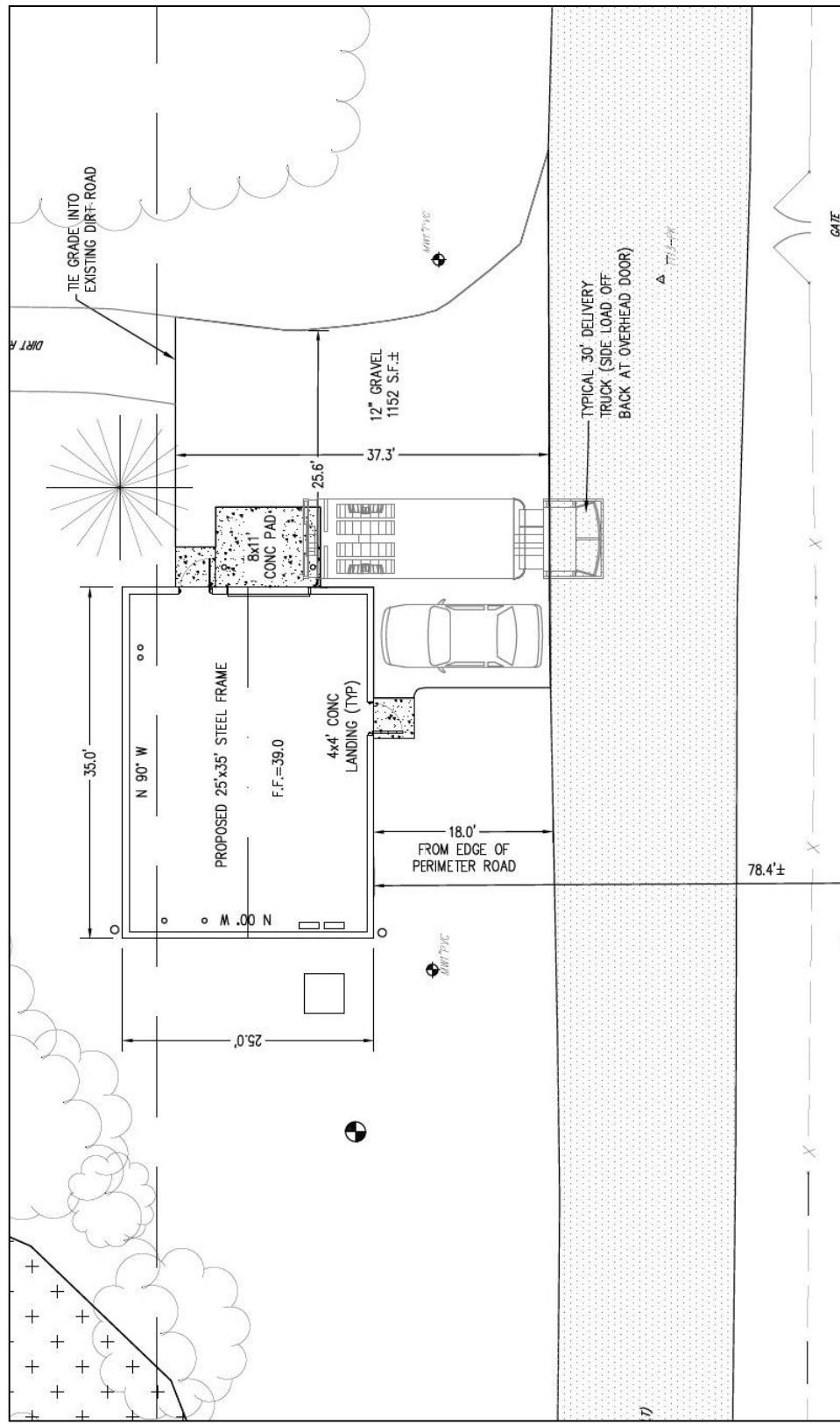


- Record of Decision (ROD) in May 2012.
- Selected remedy for Fence Line Area – LUCs and monitoring with extraction, treatment, and infiltration .
- Remedial Design for Fence Line Treatment System (FLTS) in May 2012.
- Fence Line Treatment System overview:
  - Two extraction wells, total of 100 gallons per minute.
  - VOCs removed via air stripping.
  - Treated groundwater re-injected through infiltration galleries, meeting MCLs.
- Construction began in October 2012, continued into 2013.
- System start-up occurred 8 October 2013.

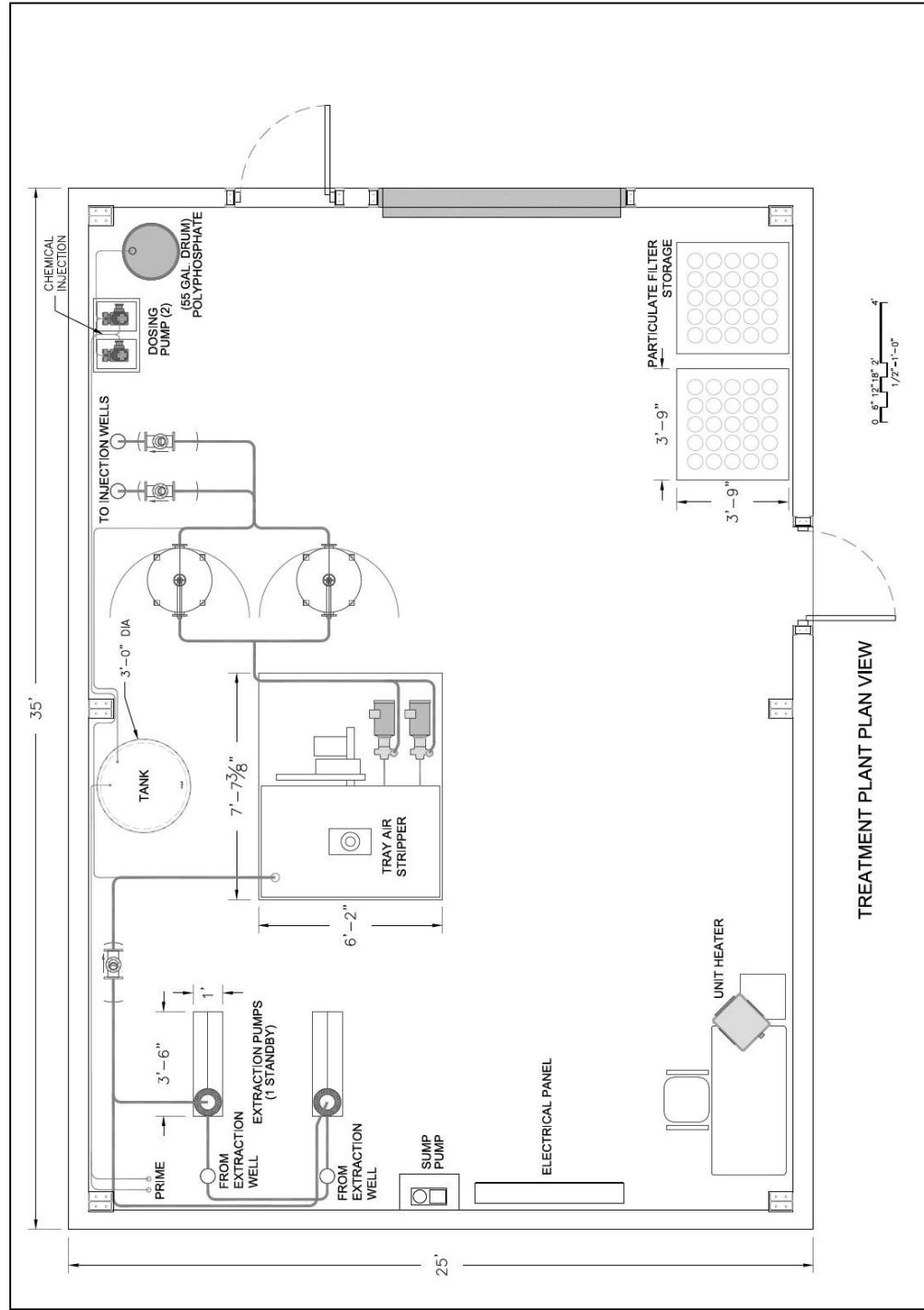
# Fence Line Treatment System Design Overview



# Fence Line Treatment System Design



# Fence Line Treatment System Design





# Fence Line Treatment System Construction

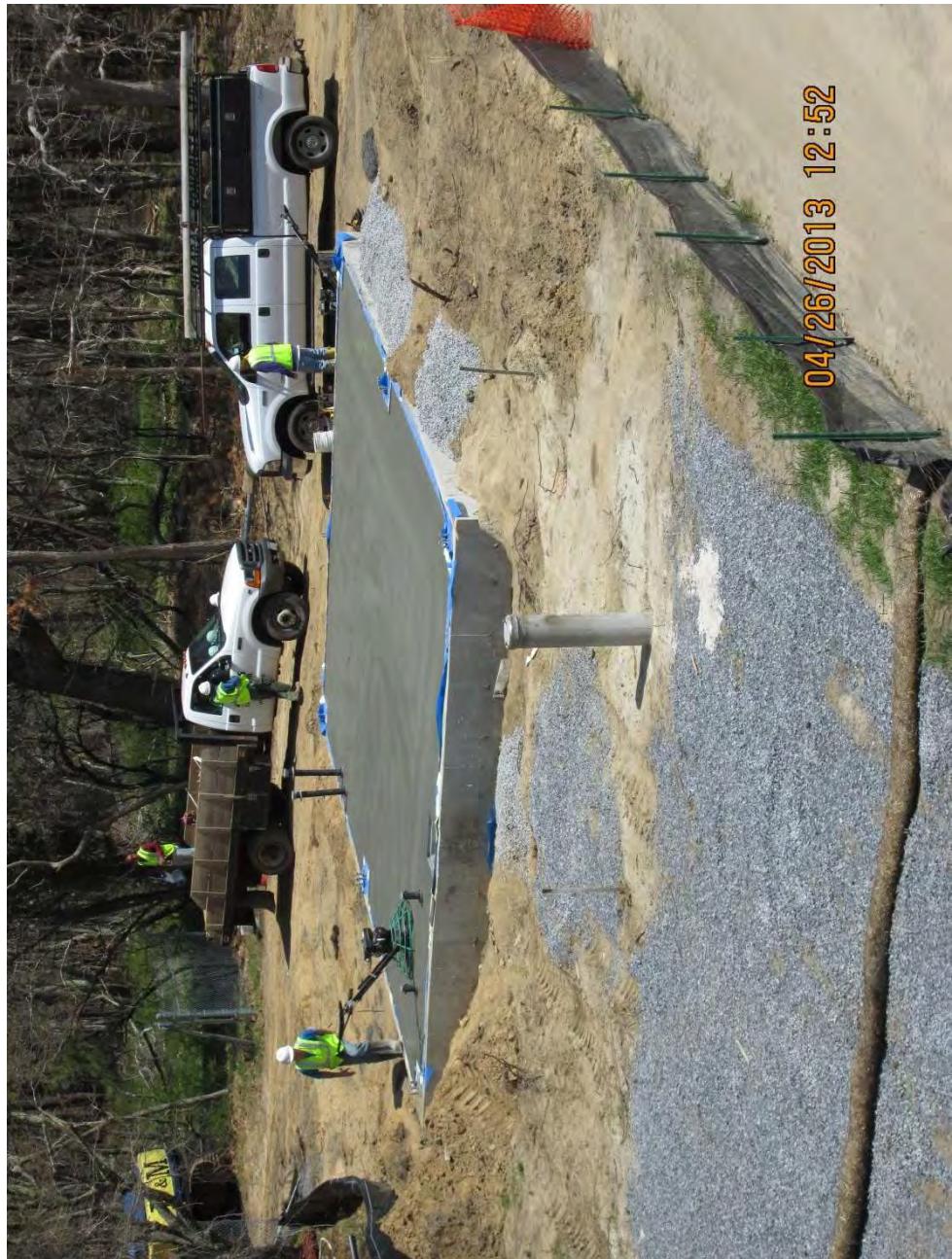
## Extraction Well





# Fence Line Treatment System Construction

## Treatment Plant Foundation and Extraction Well



# Fence Line Treatment System Construction



## Infiltration Gallery





# Fence Line Treatment System Completed

Treatment Plant Building





# Fence Line Treatment System Completed

Inside View





# Fence Line Treatment System Completed

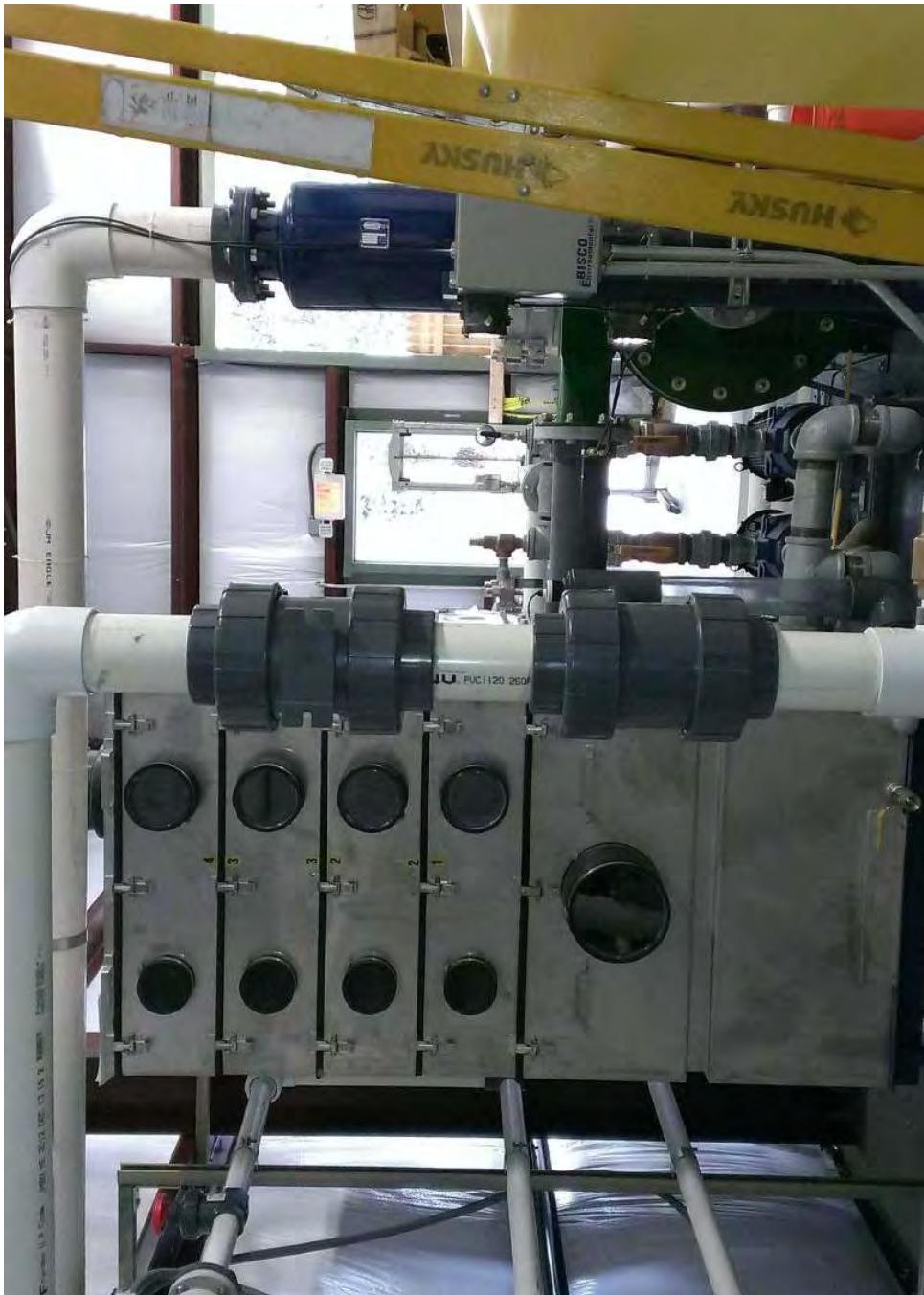
## Extraction Pumps



# Fence Line Treatment System Completed



Air Stripper





# Fence Line Treatment System Completed

## Bag Filter Units





# Fence Line Treatment System Completed

## Injection Well



# Fence Line Treatment System Start-up—

## October 2013



- Start-up of Fence Line Treatment System occurred on 8 October 2013.
- Initial 7-day continuous manned operation.
- Initial flow rate of ~85 gpm. Flow rate increased to ~95-100 gpm.
- Collected influent and effluent samples during 7-day start-up and throughout remainder of month to confirm system was performing as designed / meeting discharge criteria.
  - Removal efficiencies of greater than 99%.
  - Discharge goals being met.

# Fence Line Treatment System— Continued Operation



## ■ November/December 2013

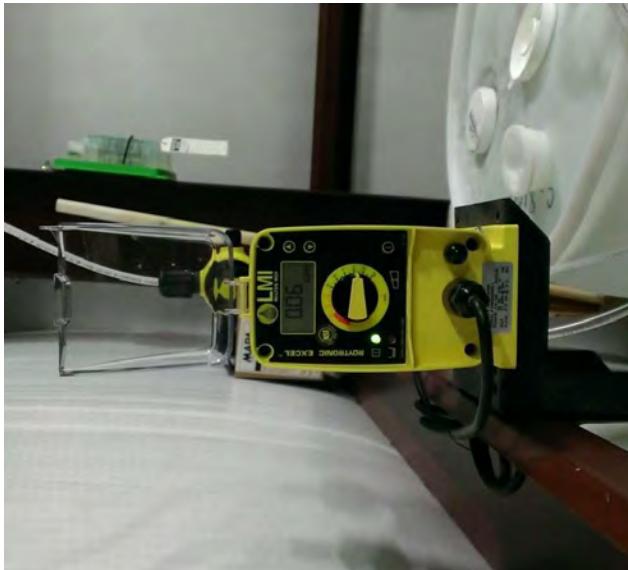
- Various construction punch list items completed (roll-up door, instrumentation, etc.).
  - Reduced flow rate temporarily due to high water table (high injection well alarms).
- ## ■ January 2014
- Flow rate reset to ~95-100 gpm.
  - System down ~6 days due to inoperable relay from power outage/surge.
- ## ■ February/March 2014
- Average flow rates >90 gpm.
  - Increased frequency of bag filter changeouts.

# Fence Line Treatment System— Continued Operation



■ April 2014

- Activated polyphosphate metering pump.
- Additional sampling performed to evaluate bag filters versus polyphosphate addition.



# Fence Line Treatment System— Continued Operation



- Six month summary:

Table 1: Flow Data

Date	Total Flow (gal)	Average Influent Flowrate (gpm)	Effective Influent Flowrate (gpm)	Uptime (%)
Oct-13*	2,976,601	89.9	68.9	76.7
Nov-13	2,288,925	78.2	53.0	67.7
Dec-13	1,715,264	61.5	38.4	62.5
Jan-14	2,358,016	77.0	52.8	68.6
Feb-14	3,814,953	96.2	94.6	98.4
Mar-14	3,794,639	91.3	85.0	93.1

# Fence Line Treatment System— Continued Operation



Table 2: Concentration of 1,1-DCA in Aqueous Stream

Date	Influent (ug/L)	Effluent / Effluent DUP (ug/L)	AS Removal Efficiency (%)
10/3/13	330	1.3	99.6
10/8/13	309	1.4	99.5
10/10/13	244	1.3	99.5
10/14/13	190	0.96	99.5
10/18/13	169	1.5	99.1
10/24/13	148	1.3	99.1
10/31/13	129	0.60 J / ND	99.5
11/14/13	140	0.79 / 0.84	99.4
12/15/13	89.8	0.61 J / 0.66 J	99.3
1/22/14	99.1	0.52 J / 0.62 J	99.5
2/19/14	88.1	0.78 J / 0.88 J	99.1
3/21/14	77.5	0.46 J / 0.44 J	99.4

# Fence Line Treatment System— Continued Operation



Table 3: Concentration of Total VOCs in Aqueous Stream

Date	Influent (ug/L)	Effluent / Effluent DUP (ug/L)	AS removal Efficiency (%)
10/3/13	486	1.3	99.7
10/8/13	457	1.4	99.7
10/10/13	362	1.3	99.6
10/14/13	291	0.96	99.7
10/18/13	259	1.5	99.4
10/24/13	206	1.3	99.4
10/31/13	164	1.5 J / ND	99.1
11/14/13	182	0.79 / 0.84	99.6
12/15/13	120	0.61 J / 0.66 J	99.5
1/22/14	136	0.52 J / 0.62 J	99.6
2/19/14	125	0.78 J / 0.88 J	99.3
3/21/14	110	0.46 J / 0.44 J	99.6

# Fence Line Treatment System— Continued Operation



Table 4: VOC Mass Removal

Date	Monthly VOC Mass Removal (lb)	Cumulative VOC Mass Removal (lb)
Oct-13	4.04	4.04
Nov-13	3.46	7.50
Dec-13	1.70	9.20
Jan-14	2.66	11.86
Feb-14	3.95	15.81
Mar-14	3.45	19.26

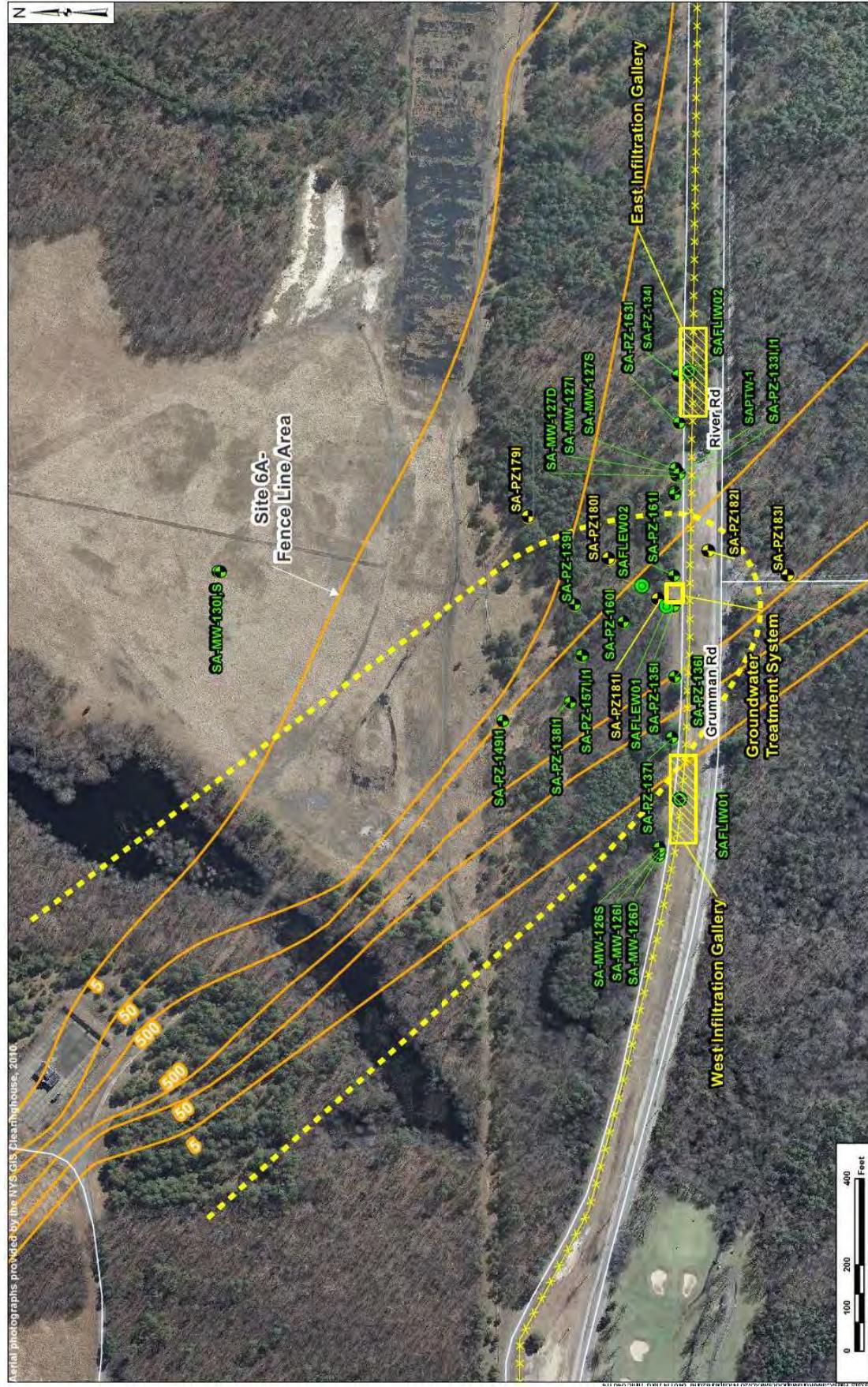
# Fence Line Treatment System— Performance and Future Activities



- Continued compliance with all discharge goals.
- Continued VOC removal efficiencies of >99%.
- Future Activities:
  - Continue to perform monthly compliance sampling.
  - Continue to submit monthly compliance reports.
  - Complete O&M Manual and Construction Completion Report.
  - Evaluate use of polyphosphate.
  - Perform hydraulic testing (step-drawdown test and yield test) to determine long-term sustainable pumping/injection rates for the extraction wells and the injection system.



# Fence Line Treatment System—Capture Zone





**SITE 7 – FUEL DEPOT AIR SPARGING/SOIL VAPOR  
EXTRACTION SYSTEM EVALUATION  
APRIL 2014 RESTORATION ADVISORY BOARD**

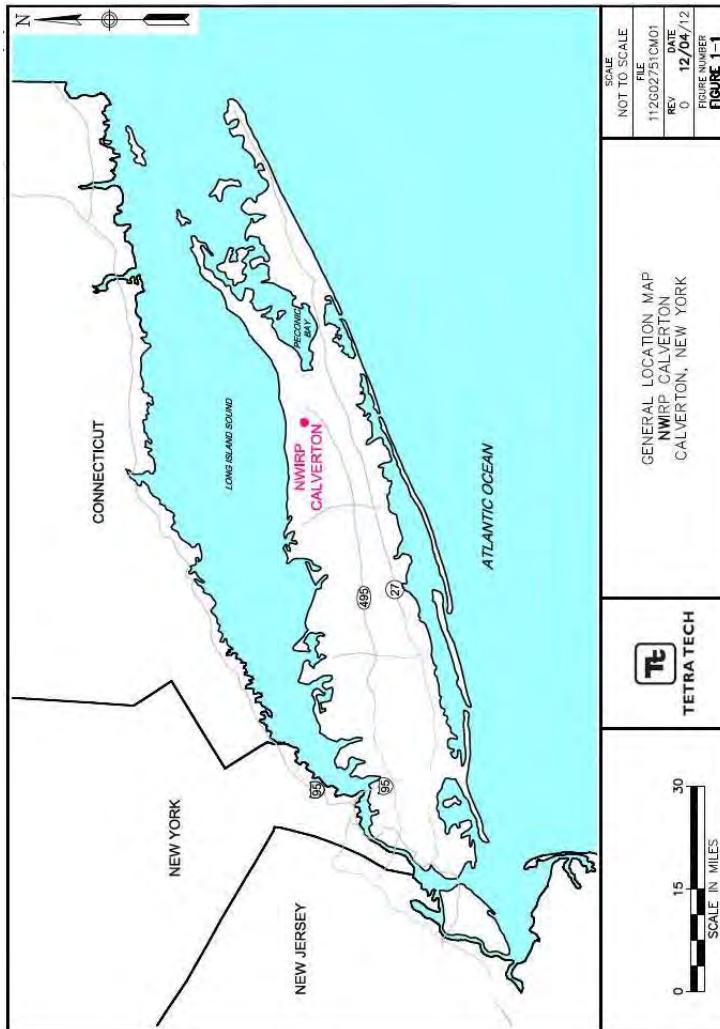
**NWIRP CALVERTON  
LONG ISLAND, NEW YORK**

4/10/2014

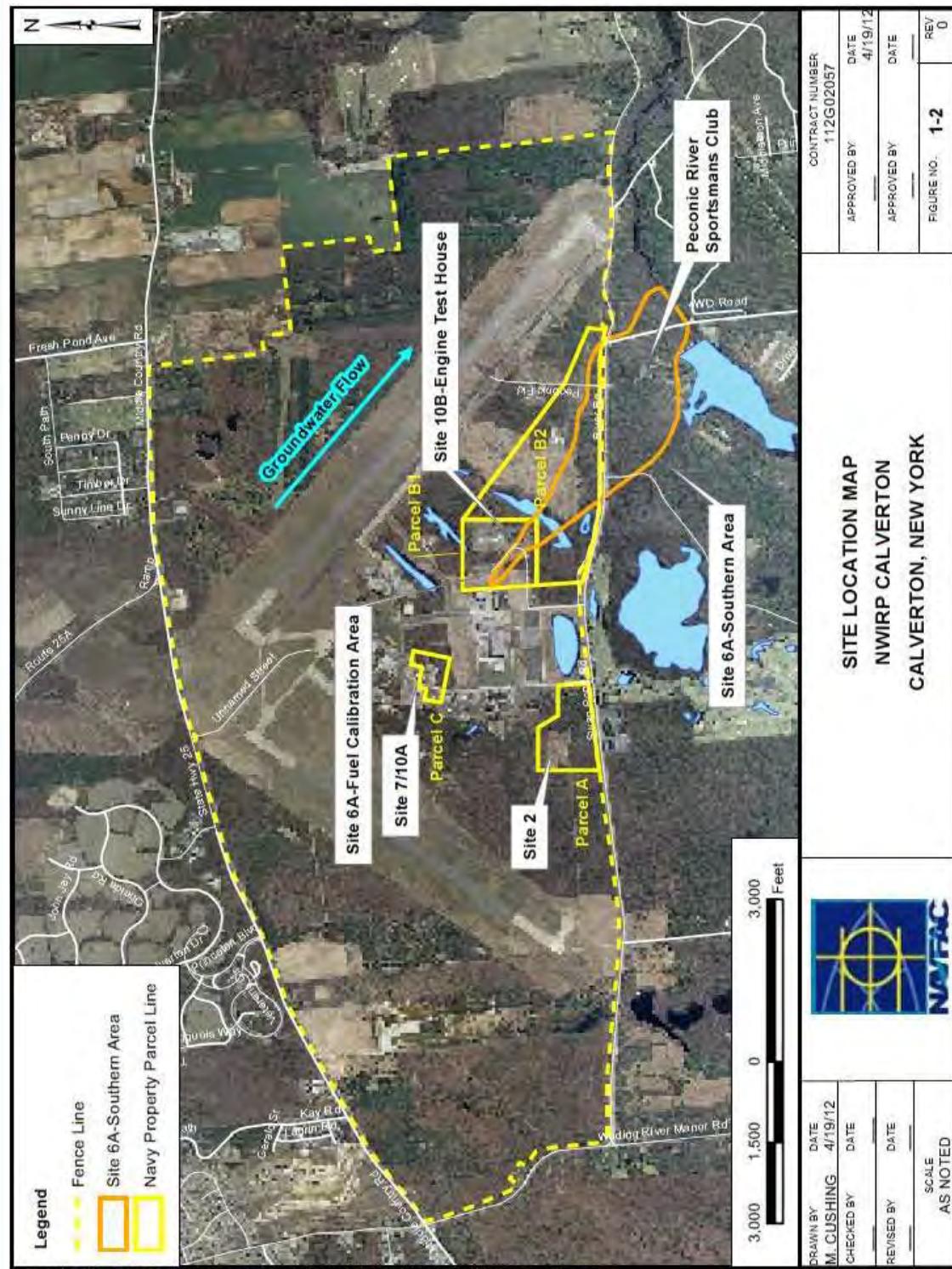
# Outline of Presentation



- Introduction
- ROD Objective
- System Performance
- Remediation Goal Evaluation
- Data Gaps
- Summary



## Introduction



# Introduction



- Air Sparging/Soil Vapor Extraction (AS/SVE) system started operation in 2005 (pilot)/2006 (full scale)
- Operated seasonally (April to December) through November 5, 2013
- Three modifications were made to the system to improve performance
- System is near the end of its functional life (major blower overhaul required)



# ROD Objective



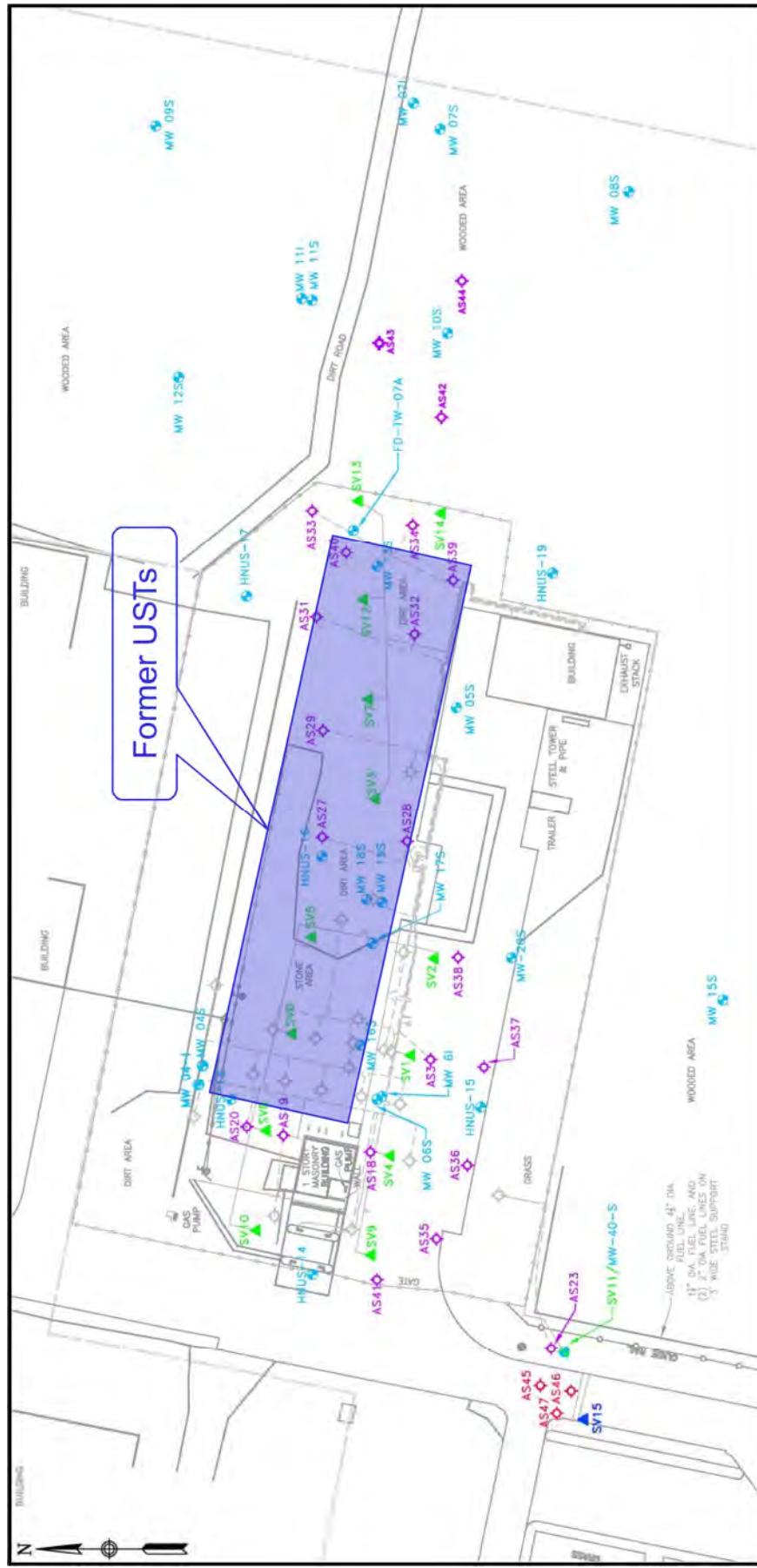
## Objective (2003 ROD):

- “Air Sparging system will be operated until (1) the selected remediation goals for soil and groundwater are achieved or (2) such time that the system is determined to no longer operate in an effective manner. The determination of effectiveness will be made by the Navy and the New York State Department of Environmental Concentration (NYSDDEC) and will be considered to be the point at which contaminant concentrations in groundwater become “diffusion controlled”. In other words, when the plot of contaminant concentration versus time becomes flat or asymptotic.”
- “If groundwater remediation goals cannot be achieved or the aquifer cannot be restored, then at a minimum, the following remediation goals should be met:
  - Reduce human exposure (ingestion, dermal contact, and inhalation) to groundwater having contaminants in concentrations greater than the remediation goals.
  - Prevent further migration of contaminants.”

## Introduction



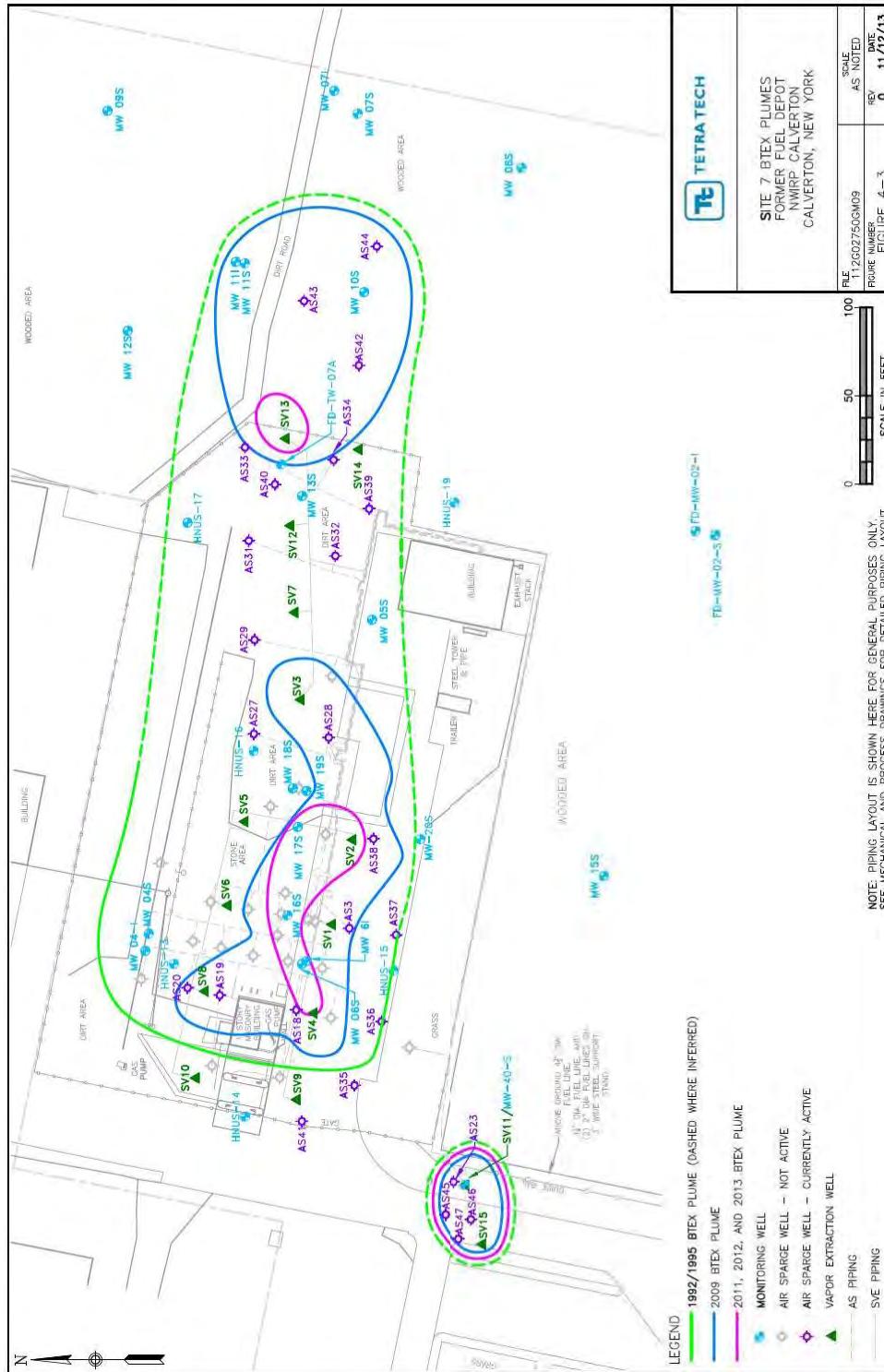
Injection, Extraction, and Monitoring Wells



# System Performance



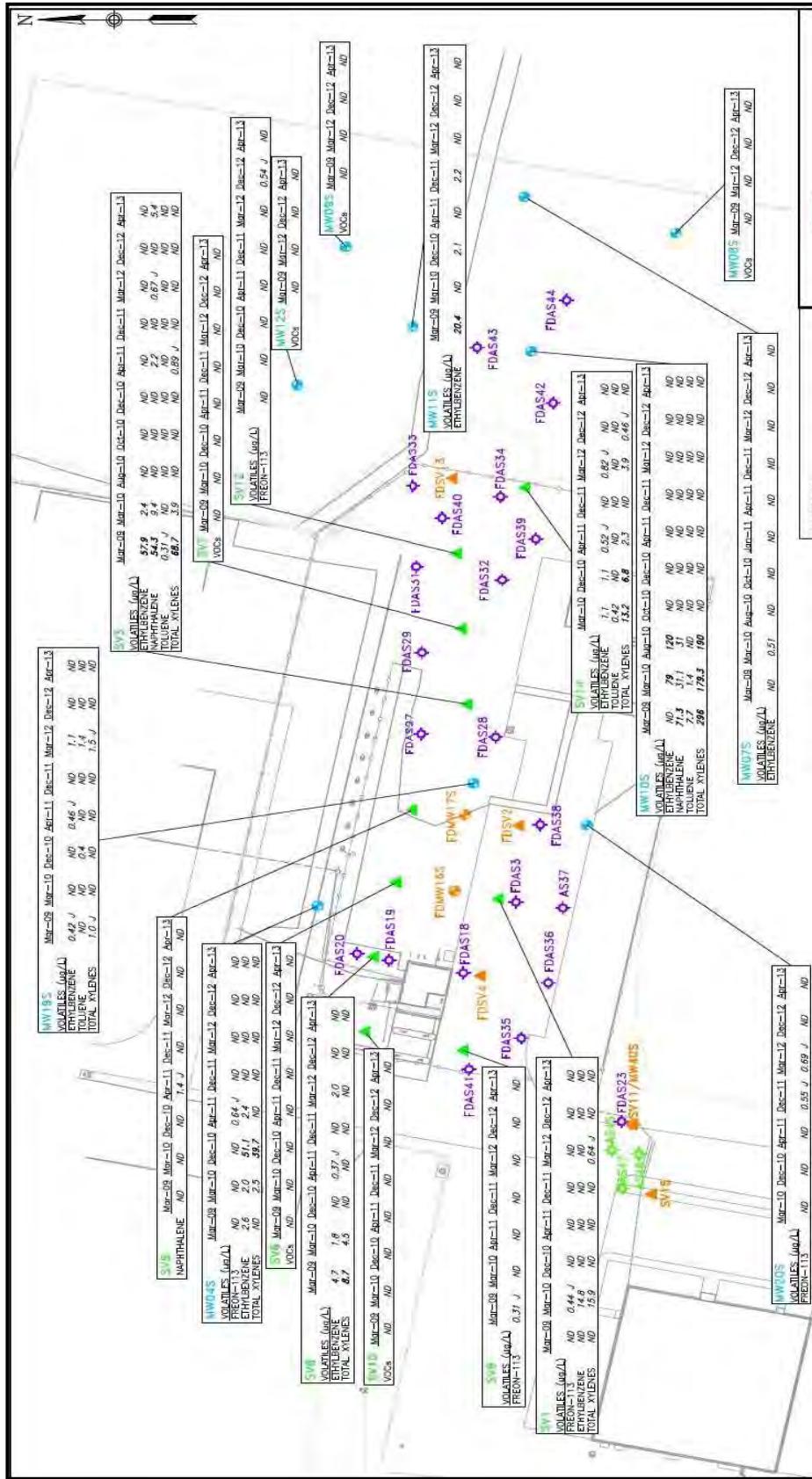
## 1992/1995, 2009, and 2011 to 2013 Plume Boundaries



# System Performance



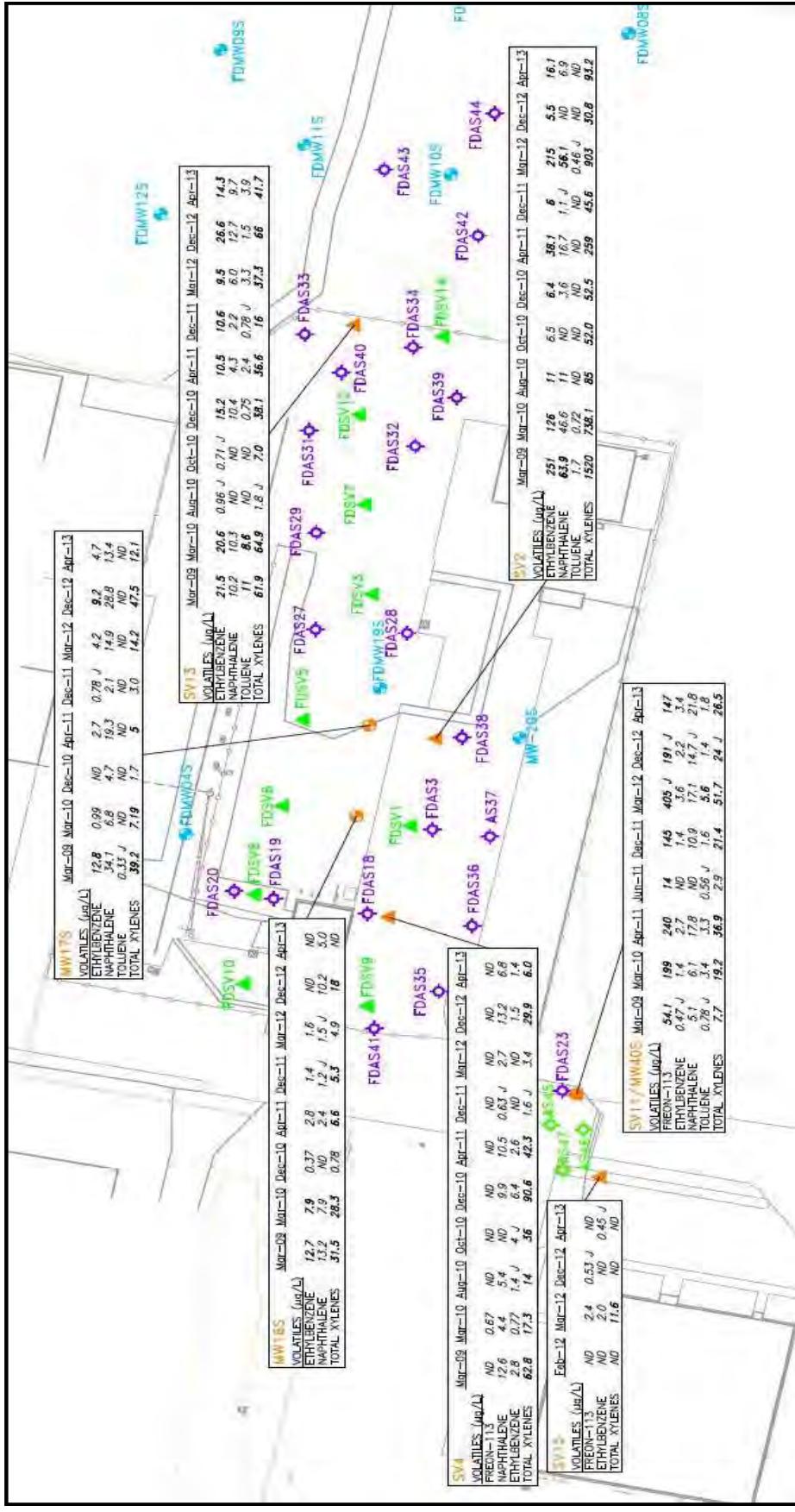
- 20 of 27 Wells have achieved the ROD remediation Goals



# System Performance



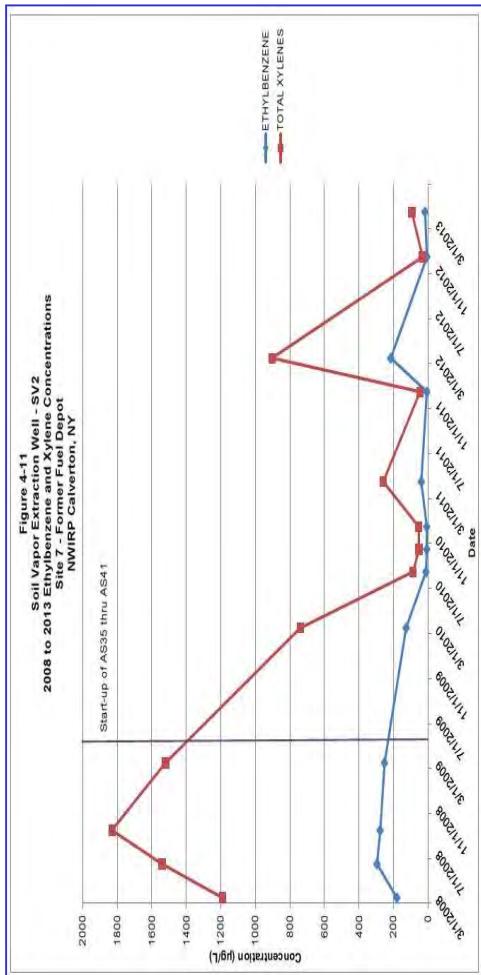
- 7 of 27 Wells have some exceedances of ROD Remediation Goals



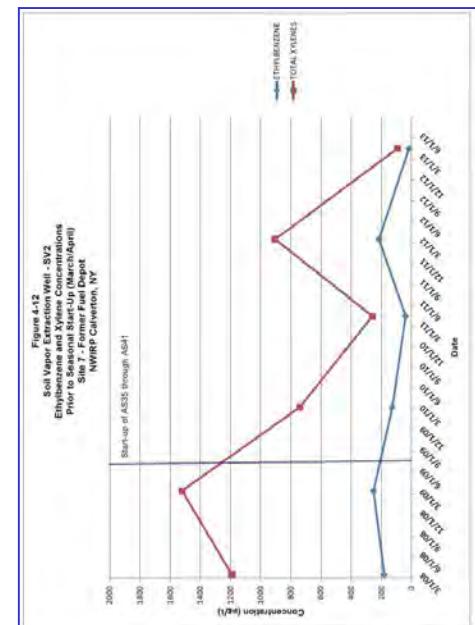
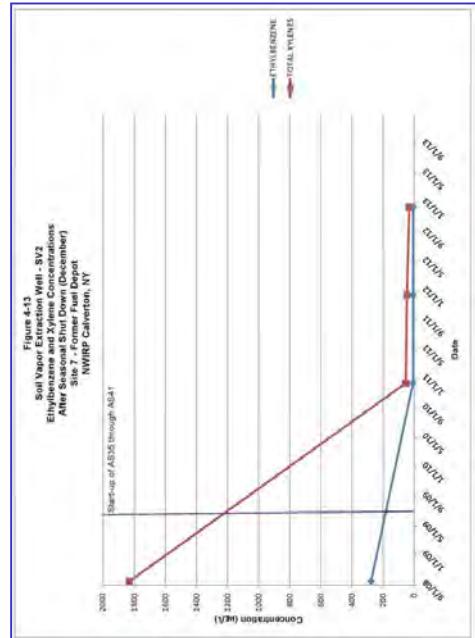
# System Performance (Seasonal Variation—SV2)



## SV2 Well - All



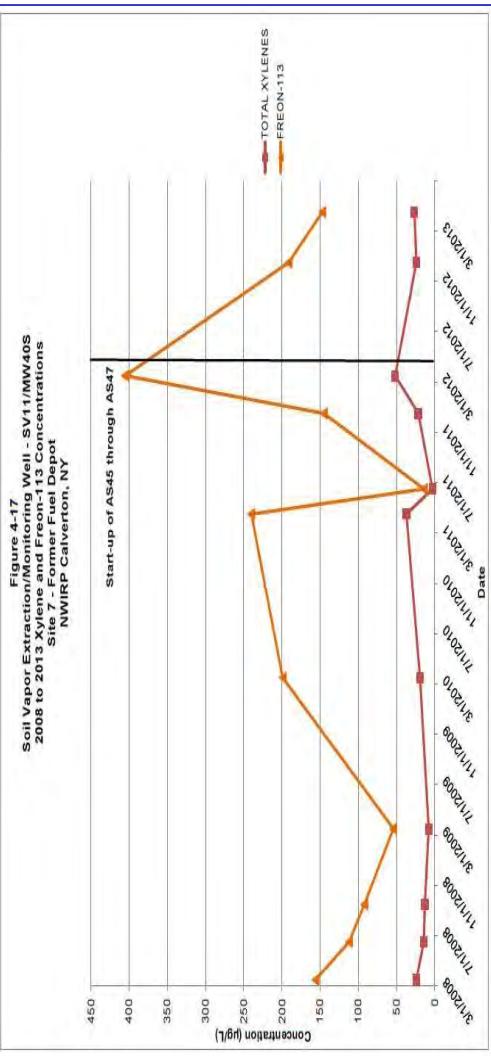
## SV2 Well - Fall



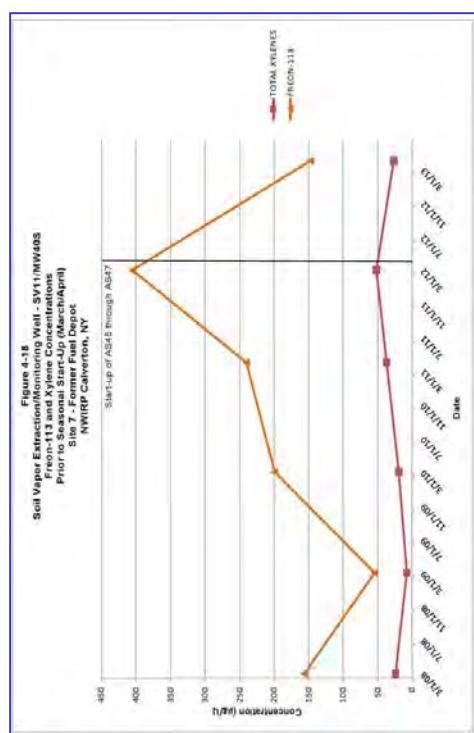
# System Performance (Seasonal Variation—SV11)



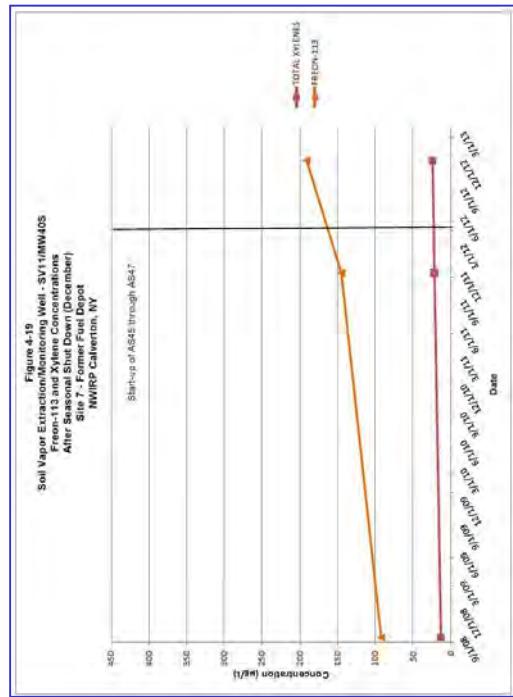
## SV 11 Well - All



## SV11 Well - Spring



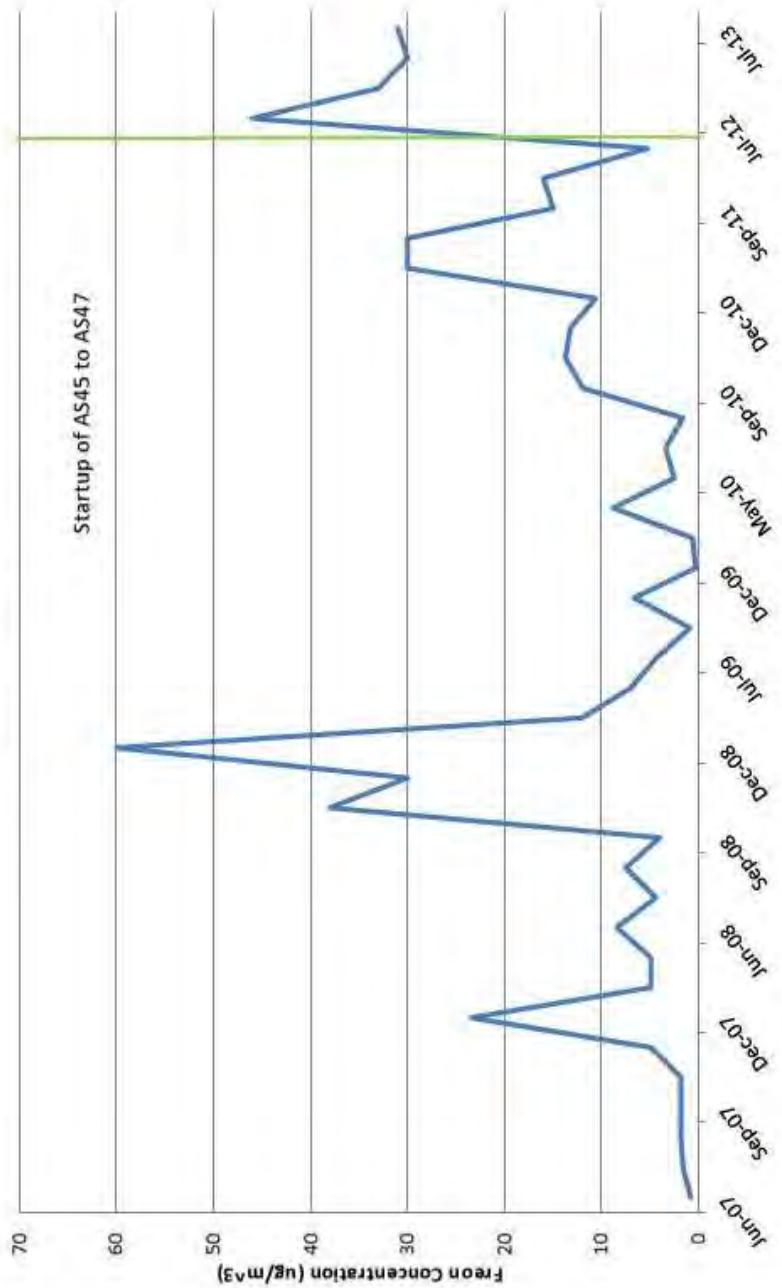
## SV11 Well - Fall



# System Performance (Freon Removal)



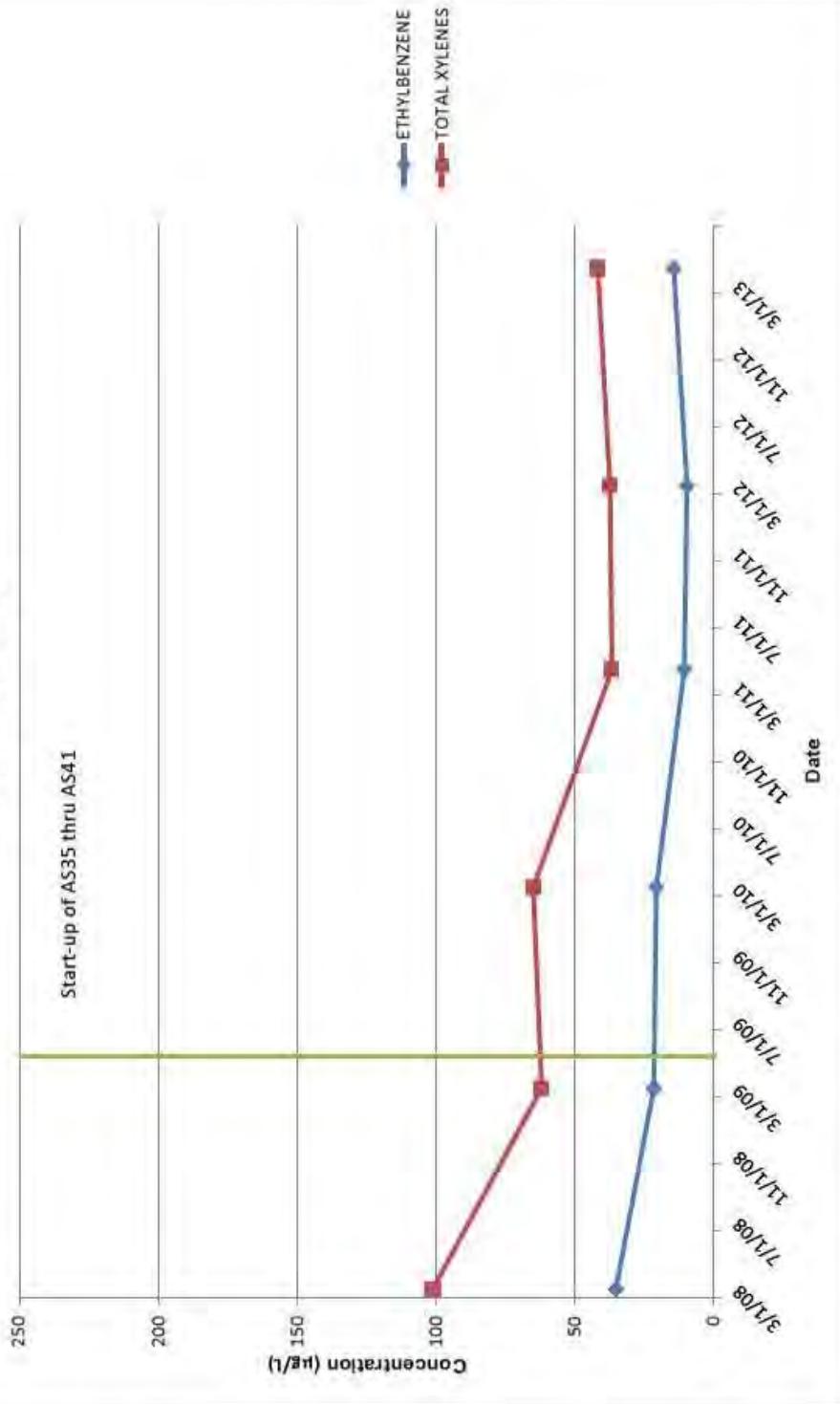
Figure 4-20  
Freon-113 Concentrations  
Pre-Carbon Vapor Samples  
Site 7 - Former Fuel Depot  
NWIRP Calverton, NY



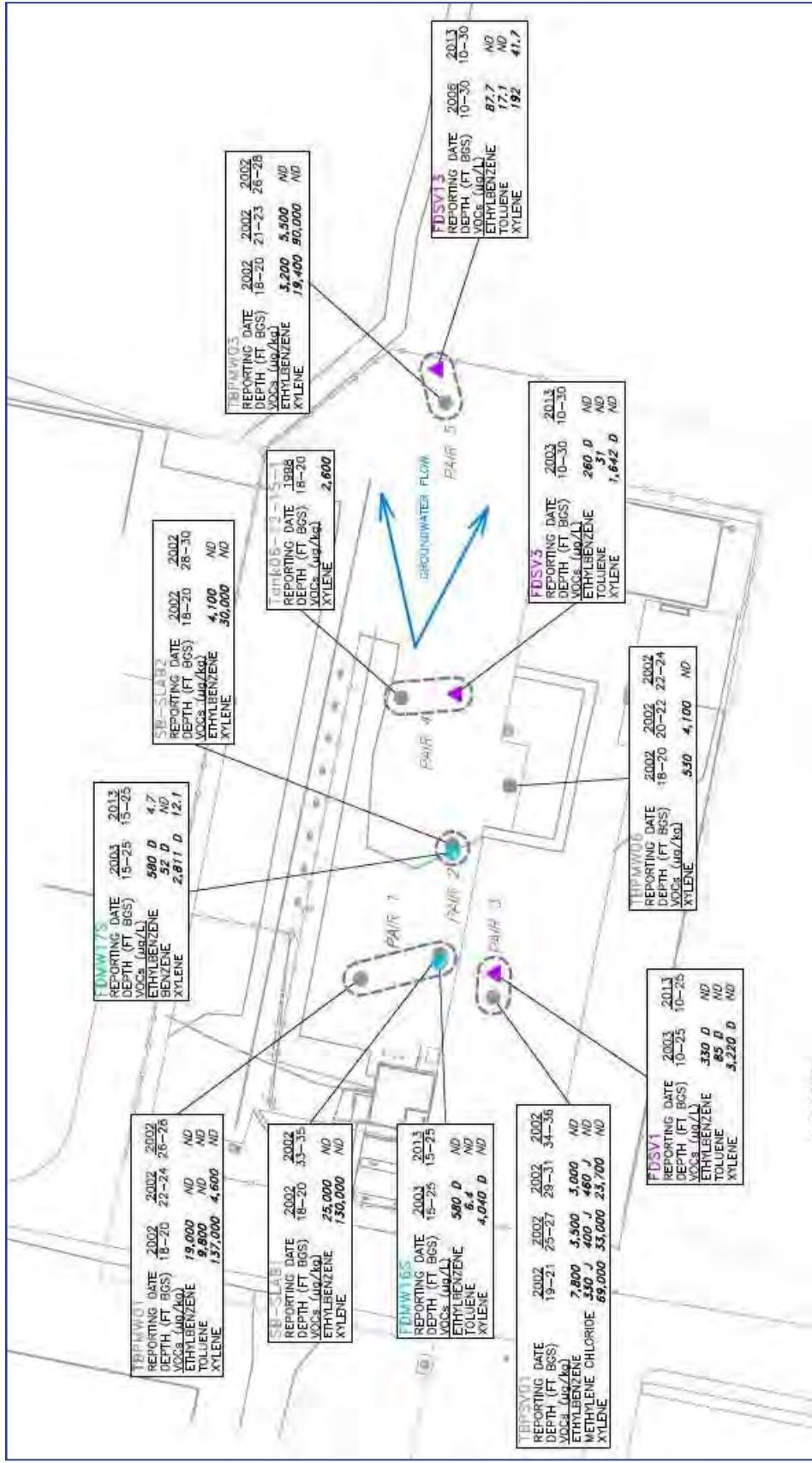
# System Performance (SV13 - Spring)



Figure 4-22  
Soil Vapor Extraction Well - SV13  
Ethylbenzene and Xylene Concentrations  
Prior to Seasonal Start-up (March/April)  
Site 7 - Former Fuel Depot  
NWIRP Calverton, NY



# Soil Groundwater Pairing



# Remediation Goal Evaluation (Soil)



- ROD Goals were based on TAGM 4046 which was replaced by Part 375 Regulations
- Revised Goals (2013 Proposed Closeout Goals) would be based on depth below ground surface:
  - 0 to 15 feet - Unrestricted Use, Residential Use, and/or Protection of Groundwater (leaching)
  - Greater than 15 feet – Protection of Groundwater
- No soil data since prior to system operation
- Protection of groundwater can be monitored with the 27 groundwater wells at the site.

# Path Forward

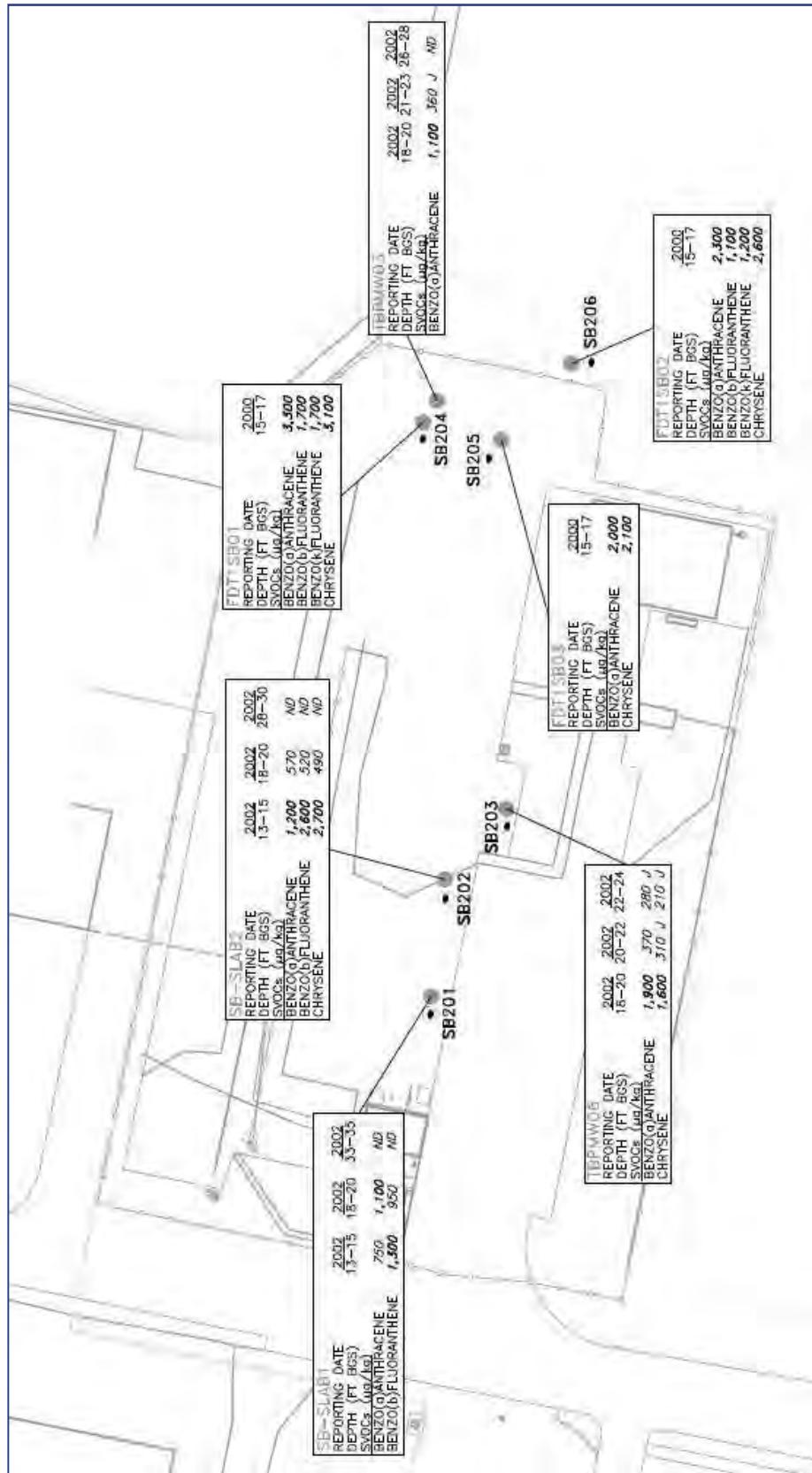


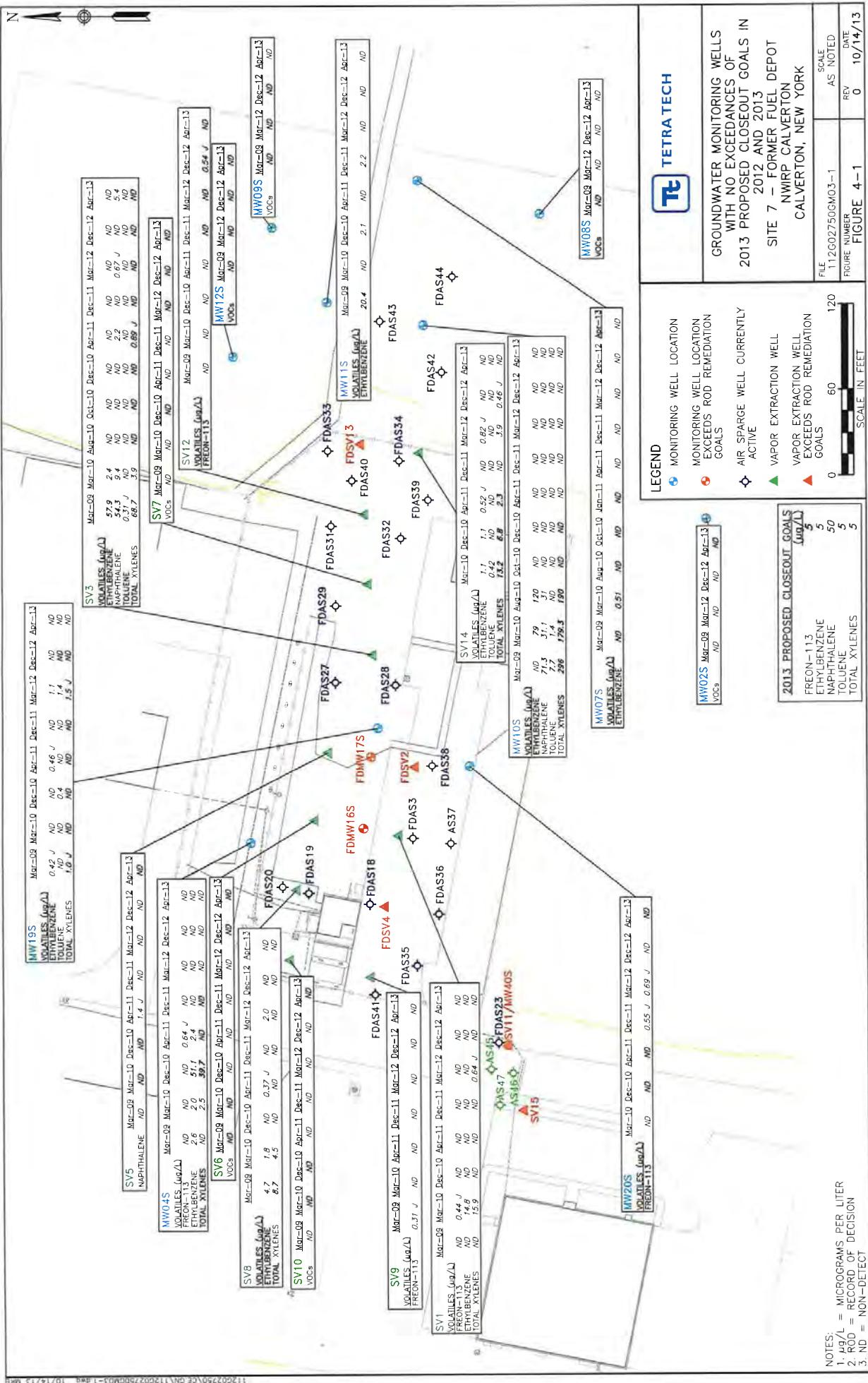
- Seasonal groundwater quality without system in operation
  - First round conducted in December 2013 – system down for one month
  - Added 2-methyl naphthalene and lead analysis
  - Second round conducted in late March 2014
- Post system startup soil data
  - 6 borings – 12 samples near the water table
- Evaluate groundwater data at the end of 2014, to determine whether a 2015 restart is warranted and locations
- Continued system operation will require a major overhaul of its blowers
  - Evaluate two smaller blowers that are stored at the site
    - If necessary, use smaller air sparge blower

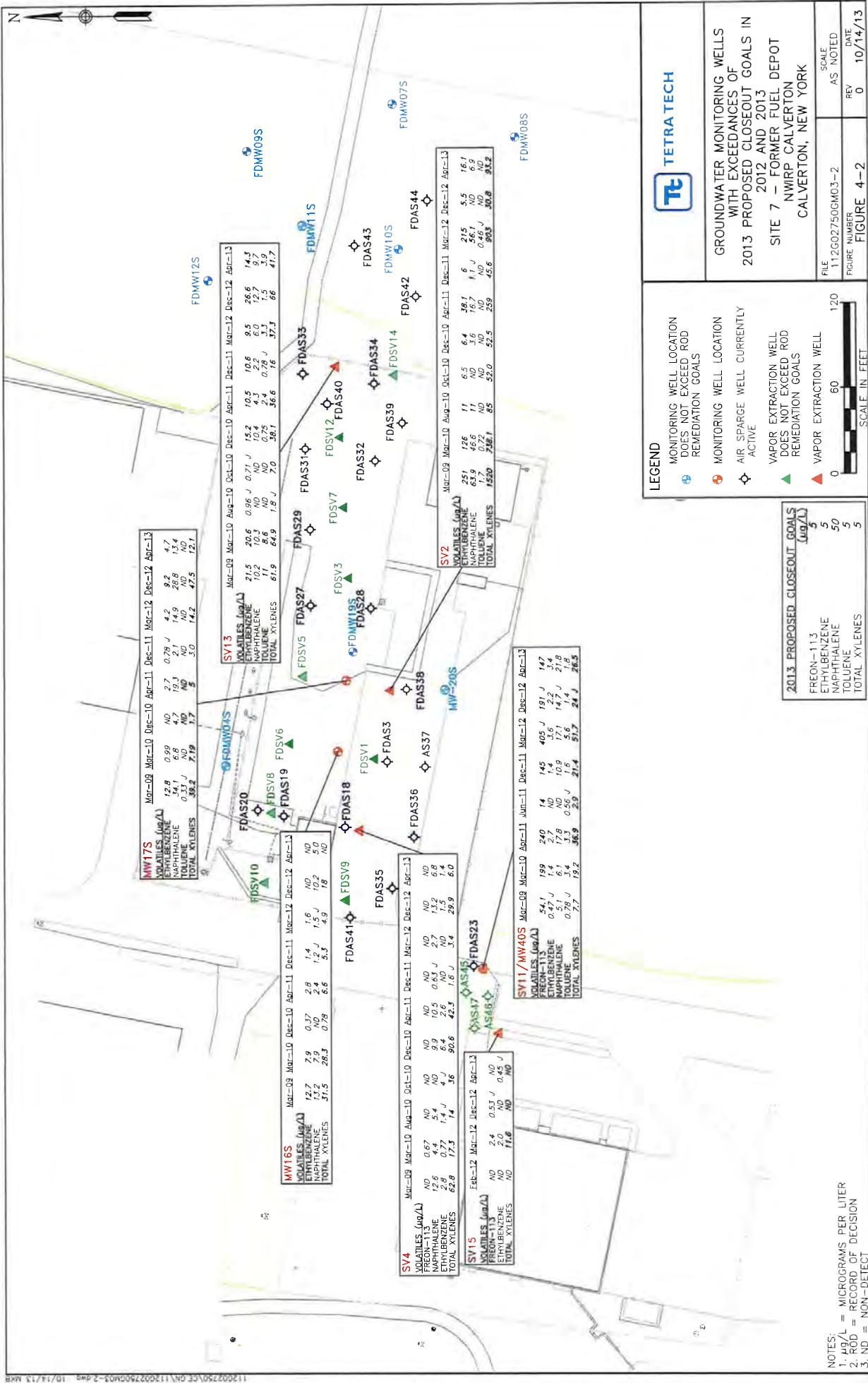
# Path Forward



- Conduct soil sampling







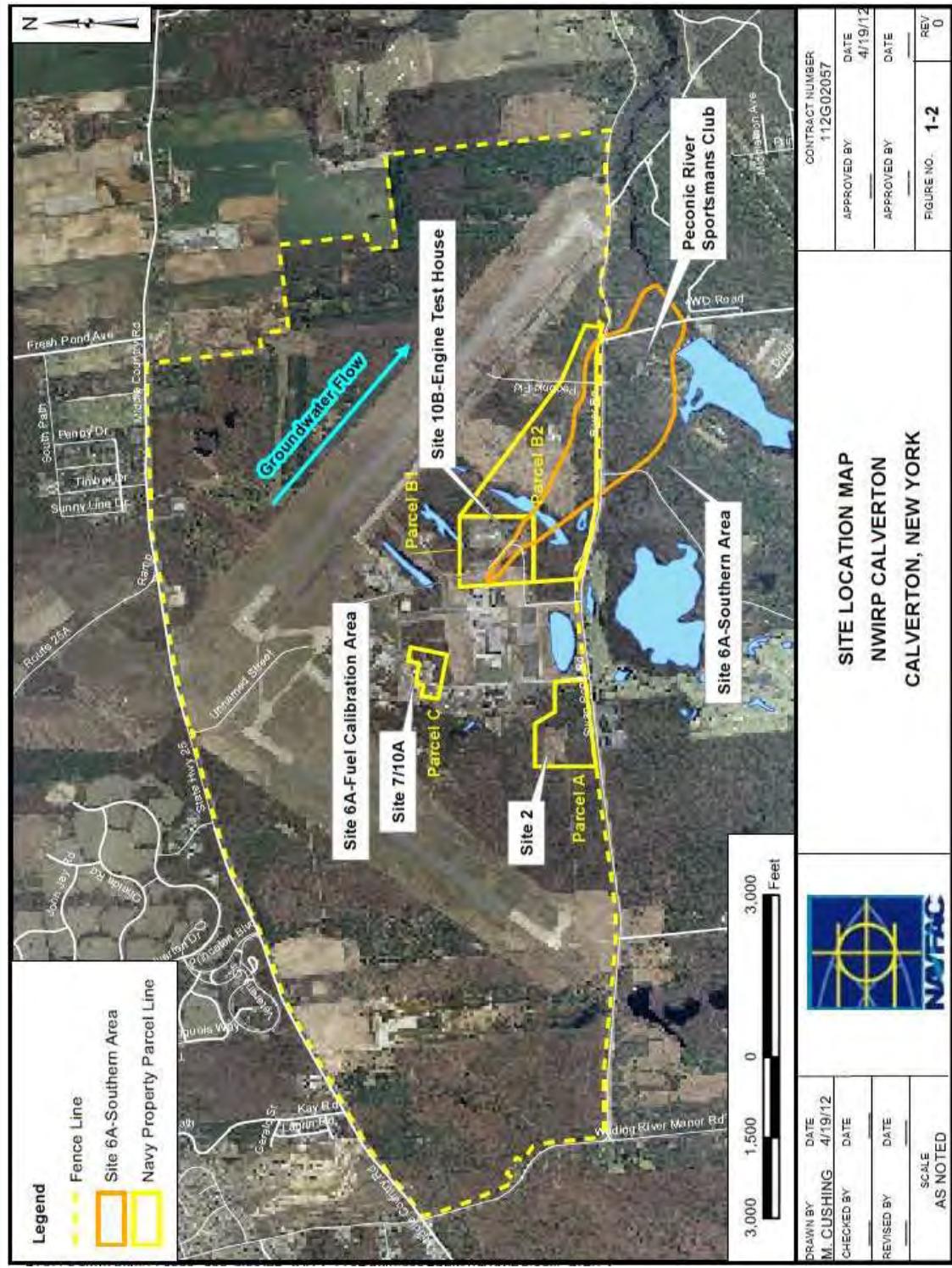


**2013 INVESTIGATIONS AT THE PECONIC RIVER AREA  
APRIL 2014 RESTORATION ADVISORY BOARD**

**NWIRP CALVERTON  
LONG ISLAND, NEW YORK**

04/10/2014

# Introduction



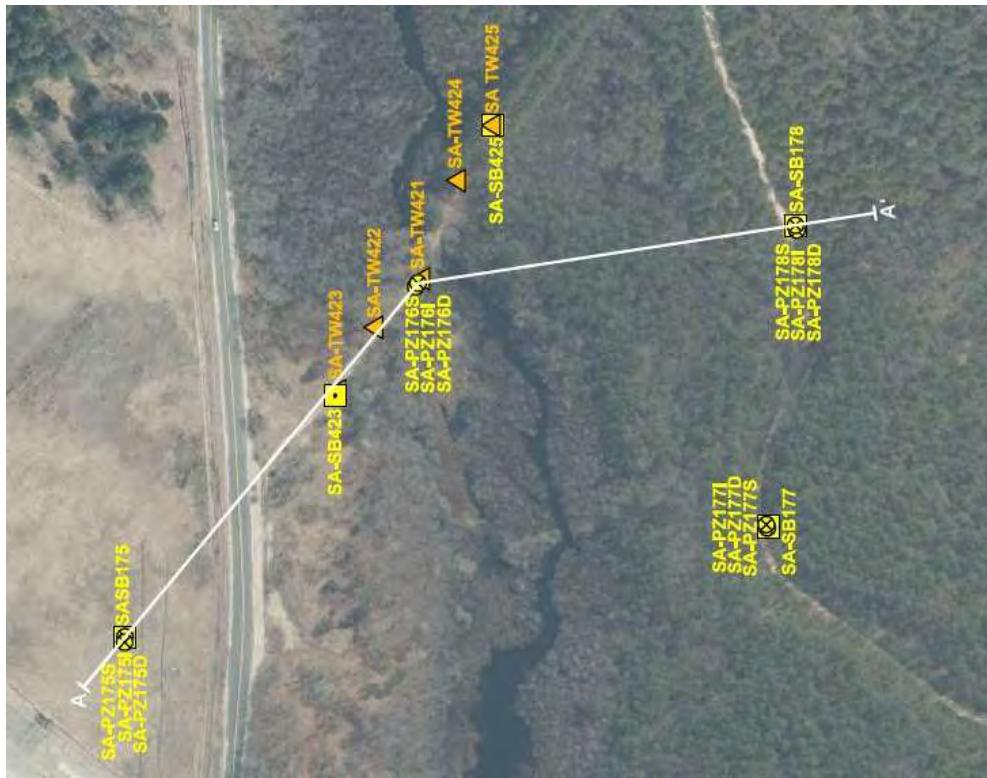
# Peconic River Area Investigation



Objective: Determine whether a portion of the Site 6A - Southern Area Groundwater Plume (1,1-DCA) is flowing beside or under the Peconic River in this area

## Activities Conducted:

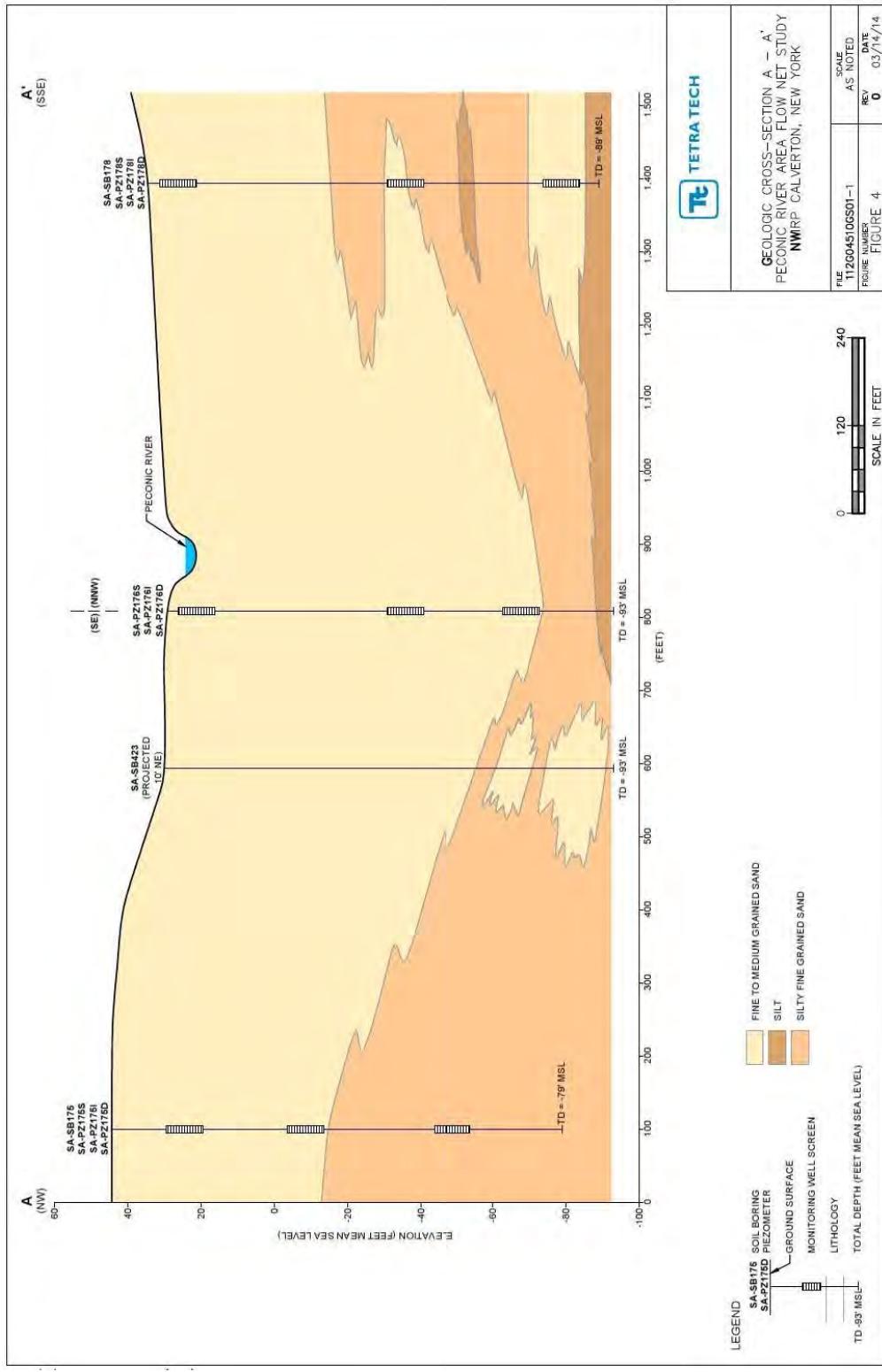
- Installed 5 soil borings to clay unit (approx. 120 feet) for lithology
- Installed 5 temporary wells, each with 9 to 12 water samples for analysis
- Installed 12 piezometers to evaluate horizontal and vertical flow
- Collected 3 rounds of water level measurements



# Peconic River Area Investigation



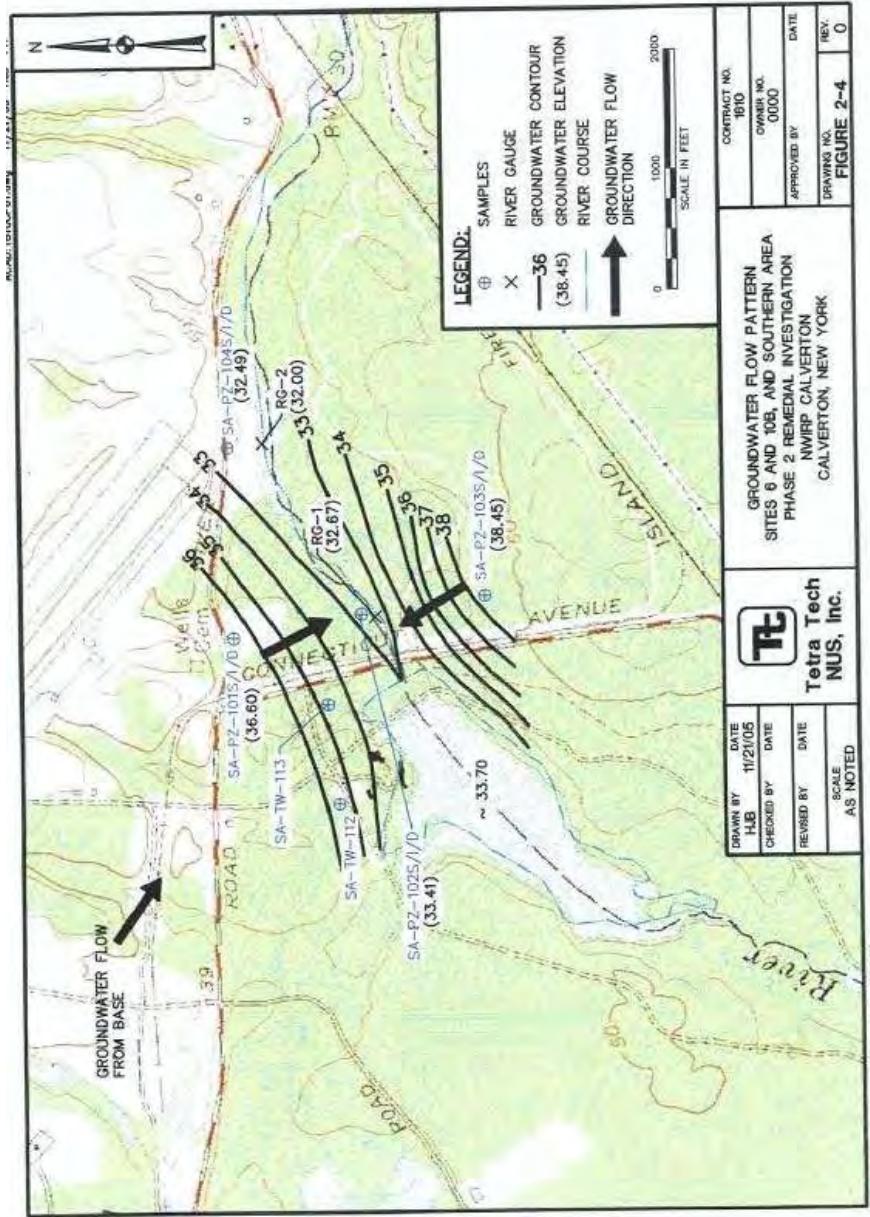
## Cross Section A-A' - Lithology





# Peconic River Area Investigation

## Flow Net Study – Connecticut Avenue



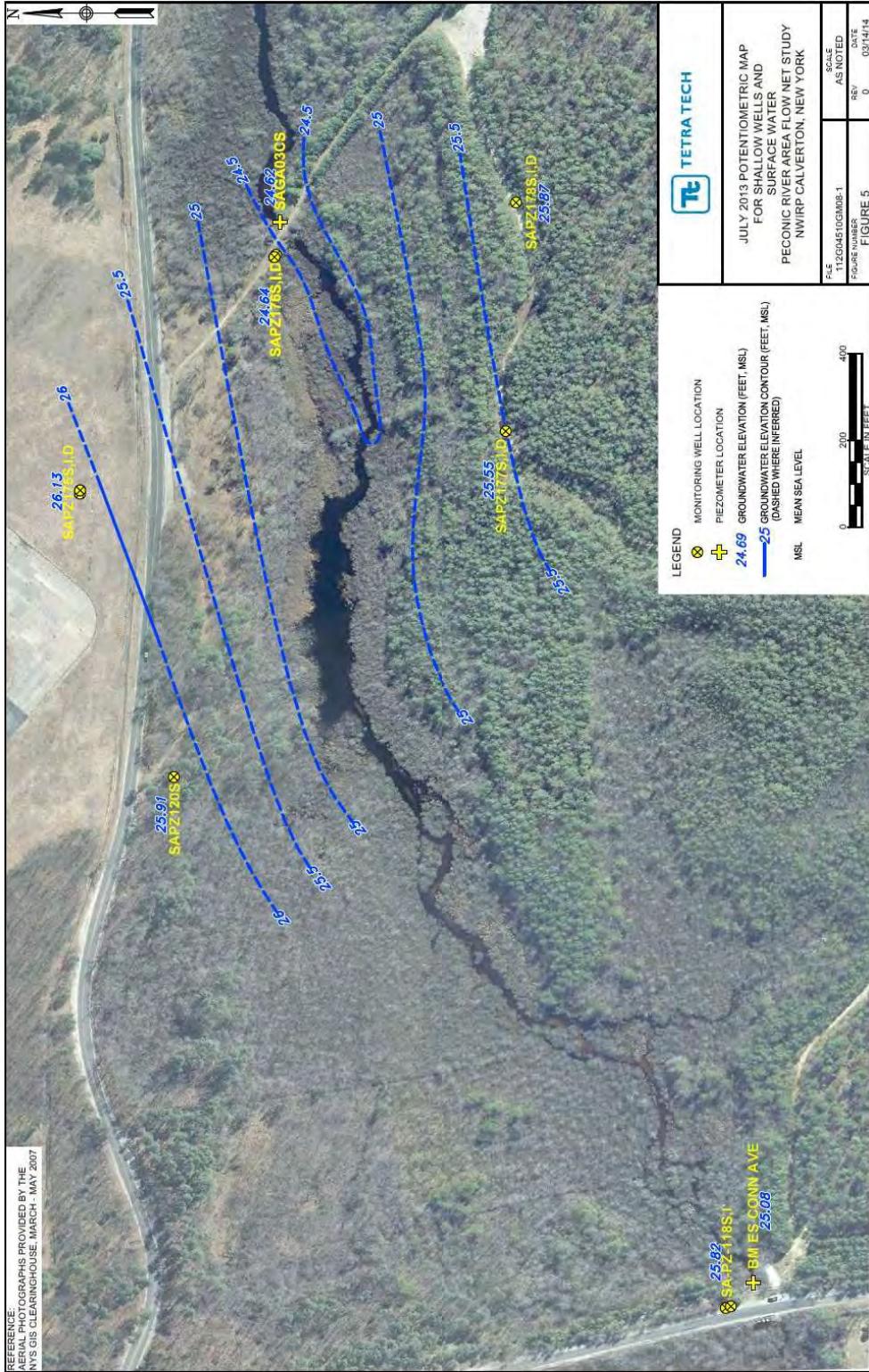
FORM DA FORM 1010 - 1000-24005 - USE 1-5/10/98



## **Peconic River Area Investigation**

Flow Net Study – Runway Area – July 2013

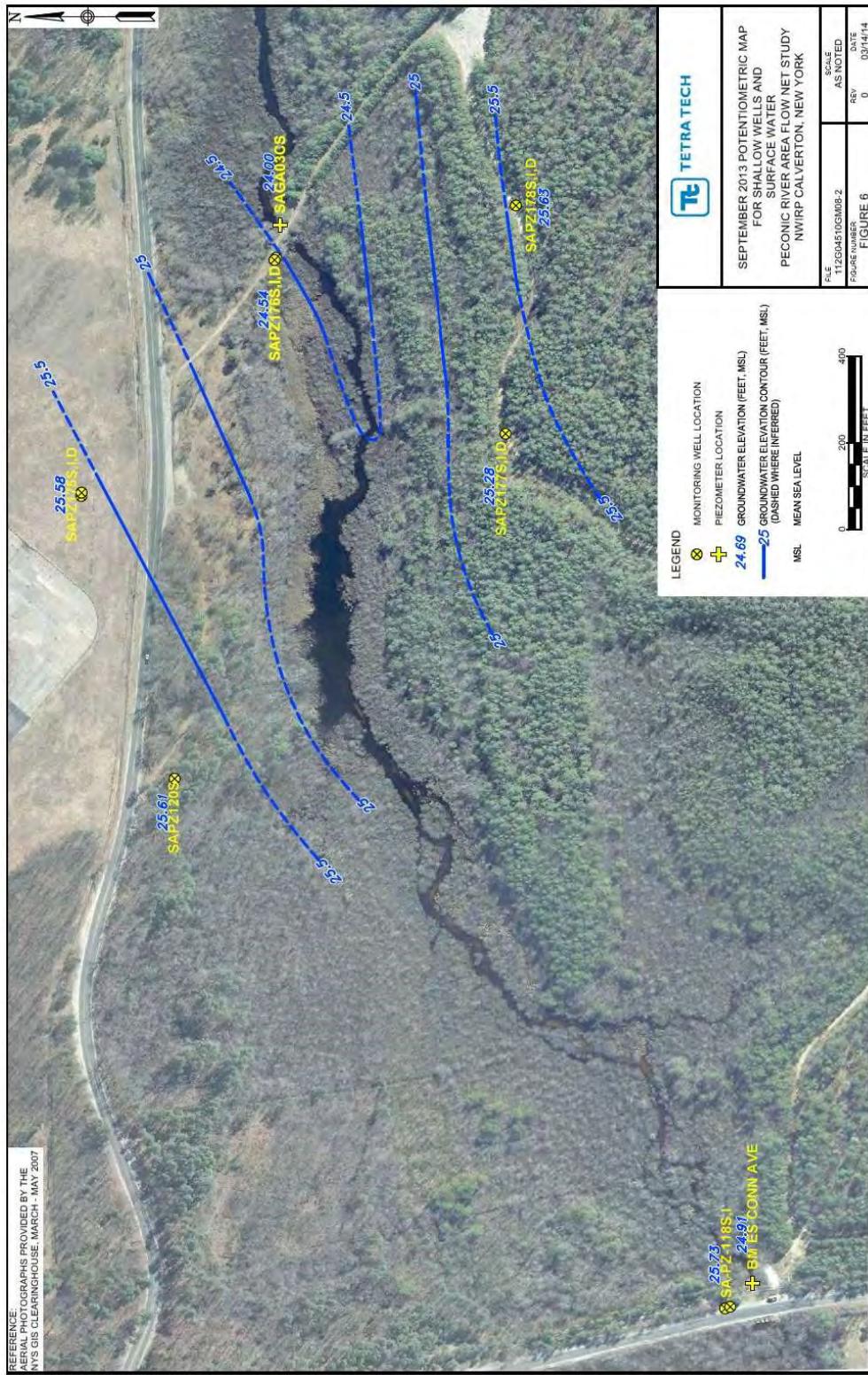
REFERENCE:  
AERIAL PHOTOGRAPHS PROVIDED BY THE  
NYS GIS CLEARINGHOUSE, MARCH - MAY 2007



# Peconic River Area Investigation

## Flow Net Study – Runway Area – September 2013

REFERENCE:  
AERIAL PHOTOGRAPHS PROVIDED BY THE  
NYS GIS CLEARINGHOUSE, MARCH - MAY 2007

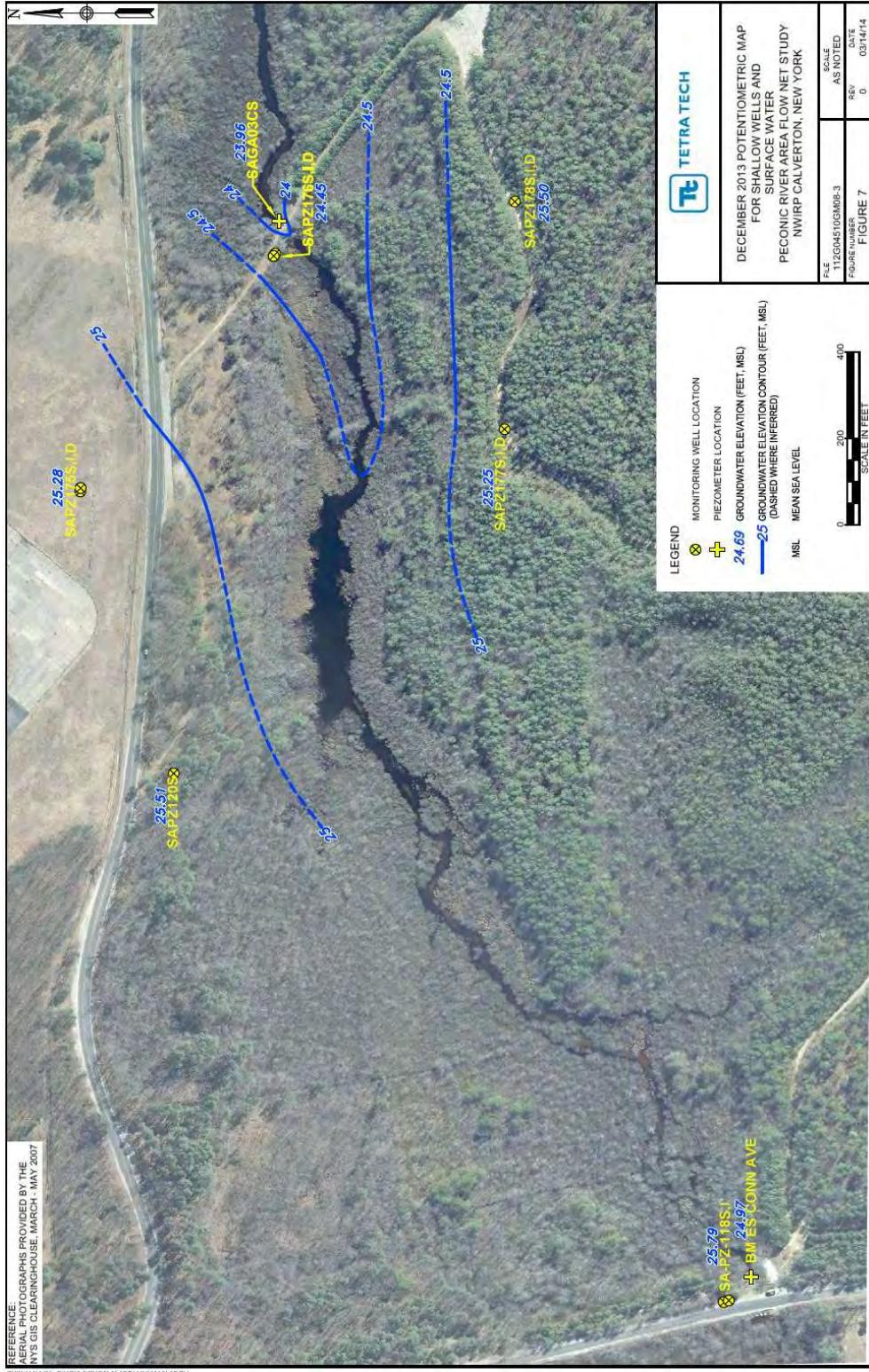


SEPTEMBER 2013 POTENTIOMETRIC MAP  
FOR SHALLOW WELLS AND  
SURFACE WATER  
PECONIC RIVER AREA FLOW NET STUDY  
NWIRP CALVERTON, NEW YORK

FIGURE 6  
REV 0  
DATE 03/14/14

# Peconic River Area Investigation

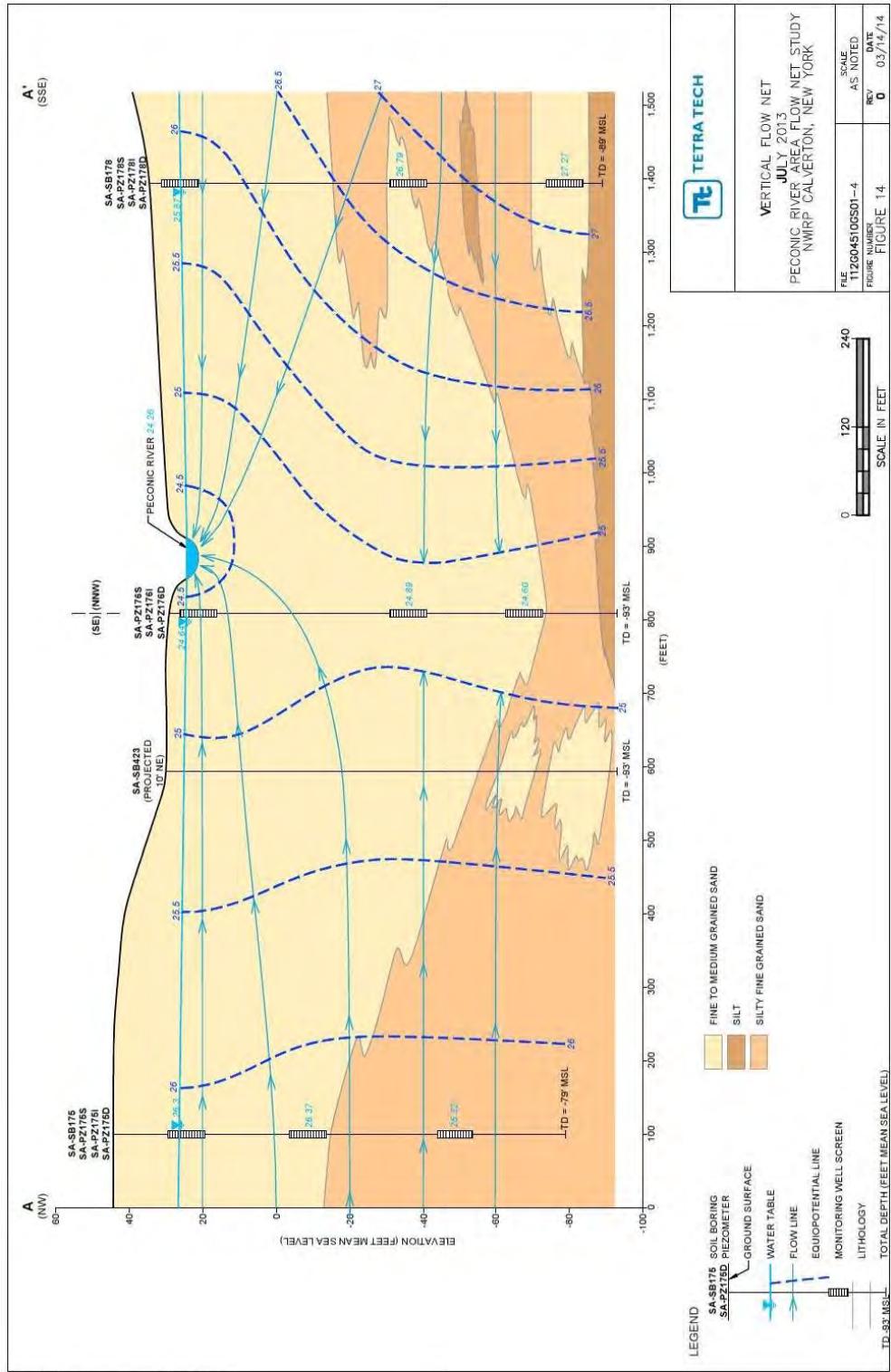
## Flow Net Study – Runway Area – December 2013





# Peconic River Area Investigation

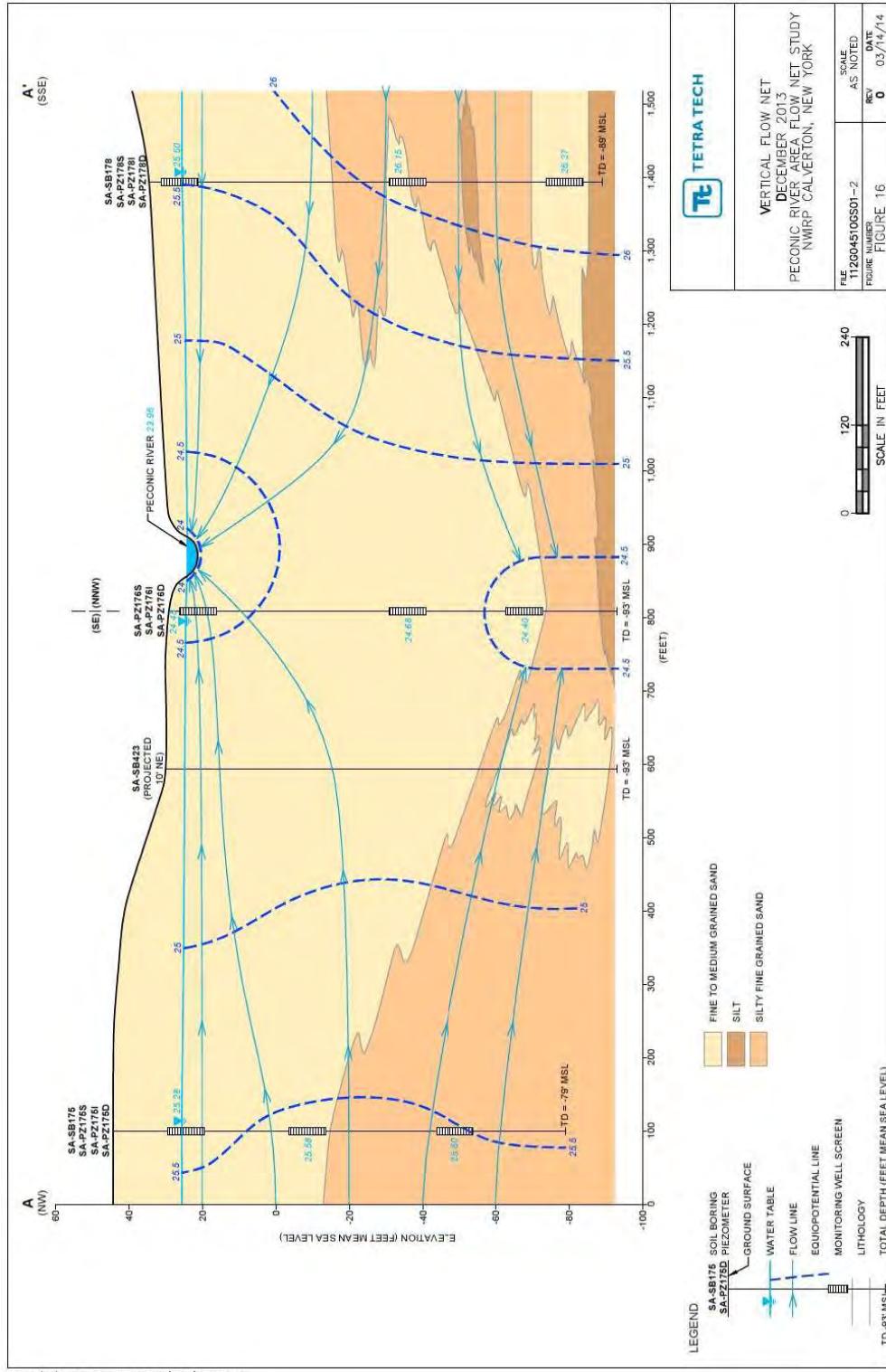
Flow Net Study – Runway Area – July 2013





# Peconic River Area Investigation

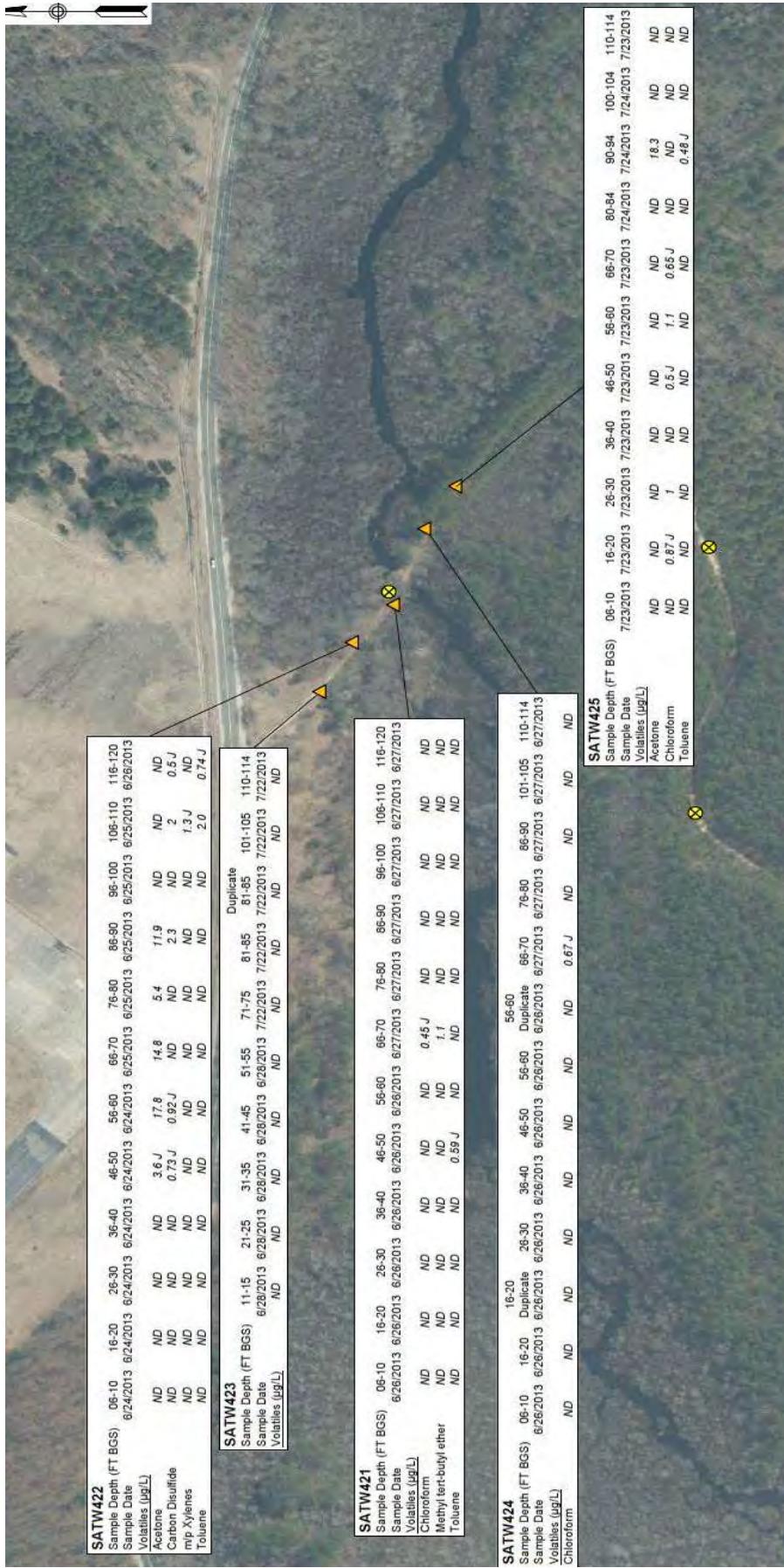
Flow Net Study – Runway Area – December 2013





## **Peconic River Area Investigation**

## Analytical Results





## Peconic River Area Investigation

### Summary:

- No evidence that the Site 6A – Southern Area plume has migrated to the Runway Area
- No evidence of groundwater under flowing the River



**2013 GROUNDWATER INVESTIGATION SUMMARY  
APRIL 2014 RESTORATION ADVISORY BOARD**

**NWIRP CALVERTON  
LONG ISLAND, NEW YORK**

**04/10/2014**

# Facility Map



# Annual Monitoring Program



- Well & Piezometer Sampling
  - 73 locations, all sampled in September 2013
  - Site 2 (Fire Training Area)
    - On-property – 16 locations (including two new wells – FTMW09I & FTMW10I)
    - Off-property – 7 locations
  - Sites 6A (Fuel Calibration Area) / 10B (Engine Test House)
    - 12 locations (including six new wells – FCMW09S/I/1 & FCMW10S/I/1)
  - Southern Area
    - On-site – 20 locations
    - Off-site – 15 locations
  - Peconic River area – 7 locations
- Surface Water and Sediment
  - 4 locations, all sampled in May and September 2013
    - Co-located surface water & sediment samples (plus 4 in-river piezometers)
- Groundwater Gauging
  - 105 wells/piezometers and 7 staff gauges



## Site 2 Groundwater Flow (September 2012)

Ortho-Imagery provided by the NYS GIS Clearinghouse, 2010.



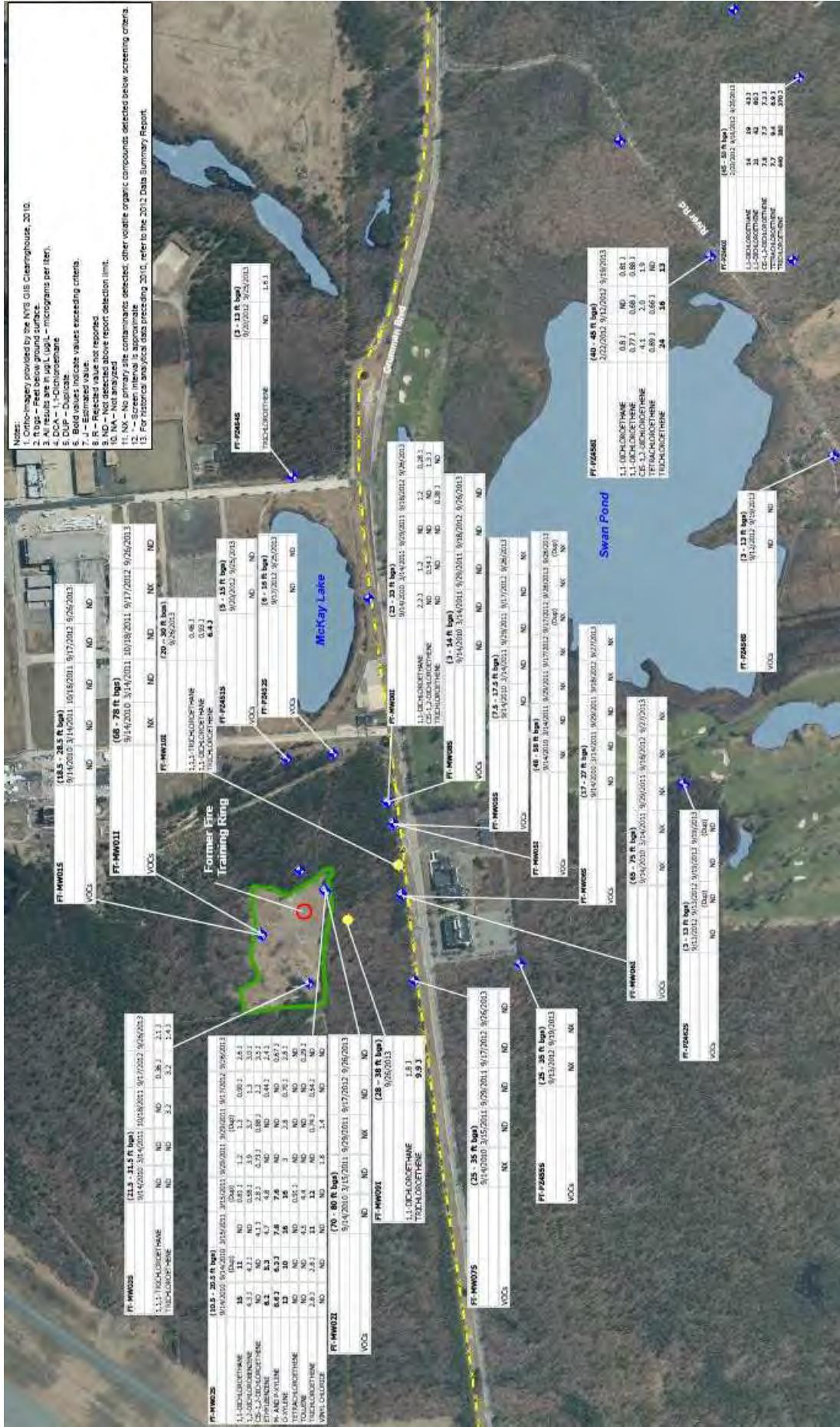


# Site 2 Groundwater Flow (September 2013)

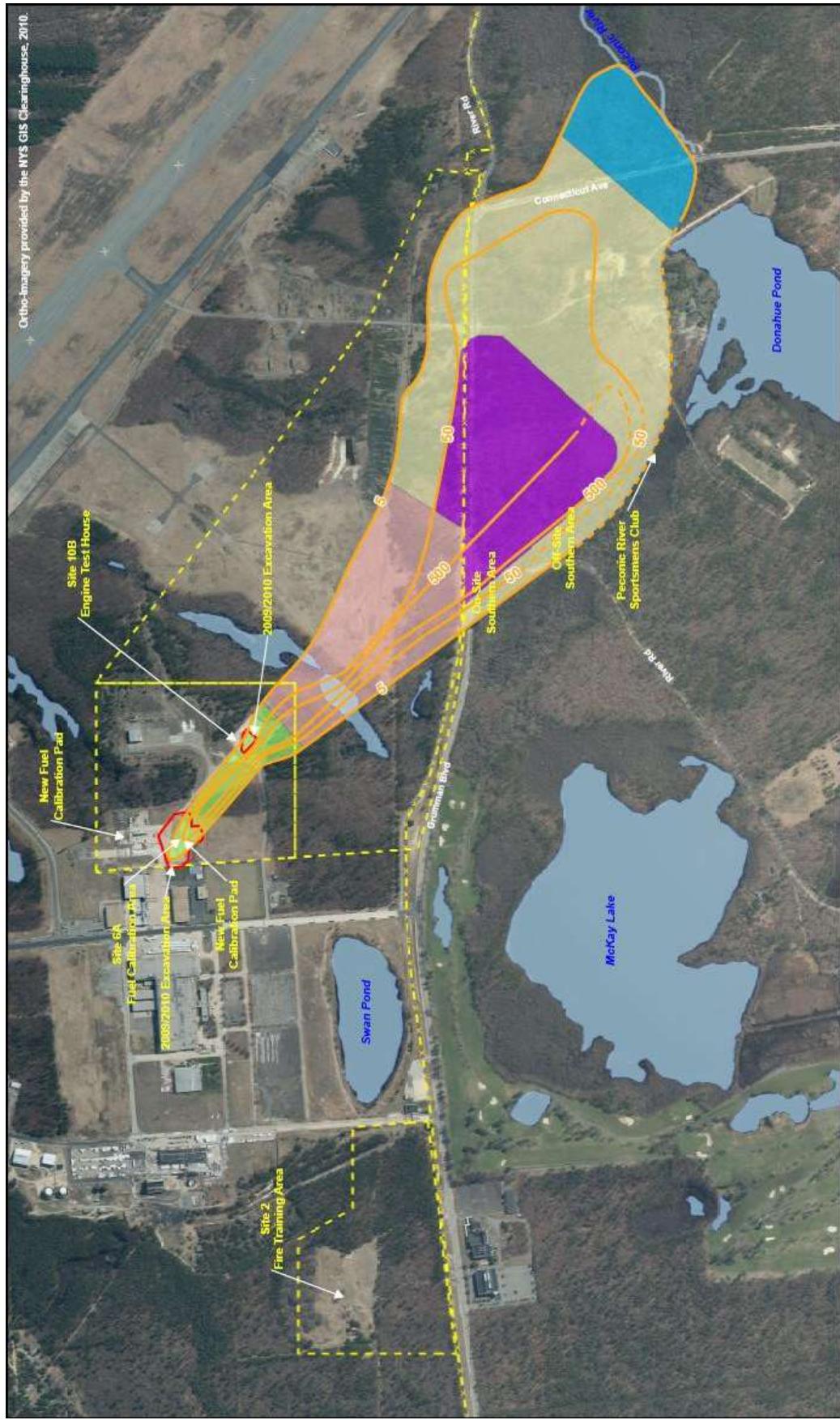
Ortho-Imagery provided by the NYS GIS Clearinghouse 2010



# Site 2 Results



# Southern Area Plume Map





# Groundwater Flow (September 2012)



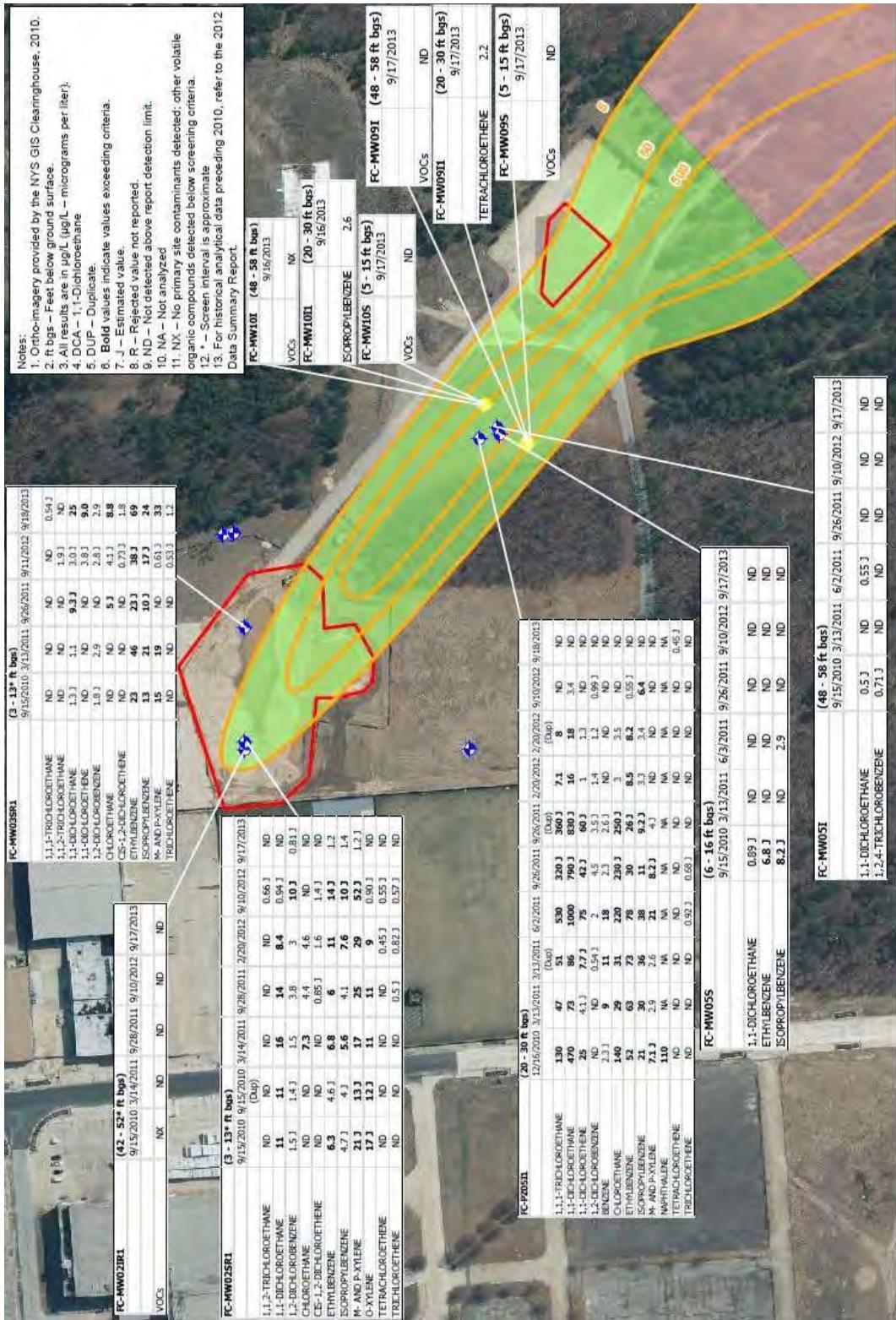
# Groundwater Flow (September 2013)



Otto-Imagery provided by the NY's GIS Clearinghouse, 2010.



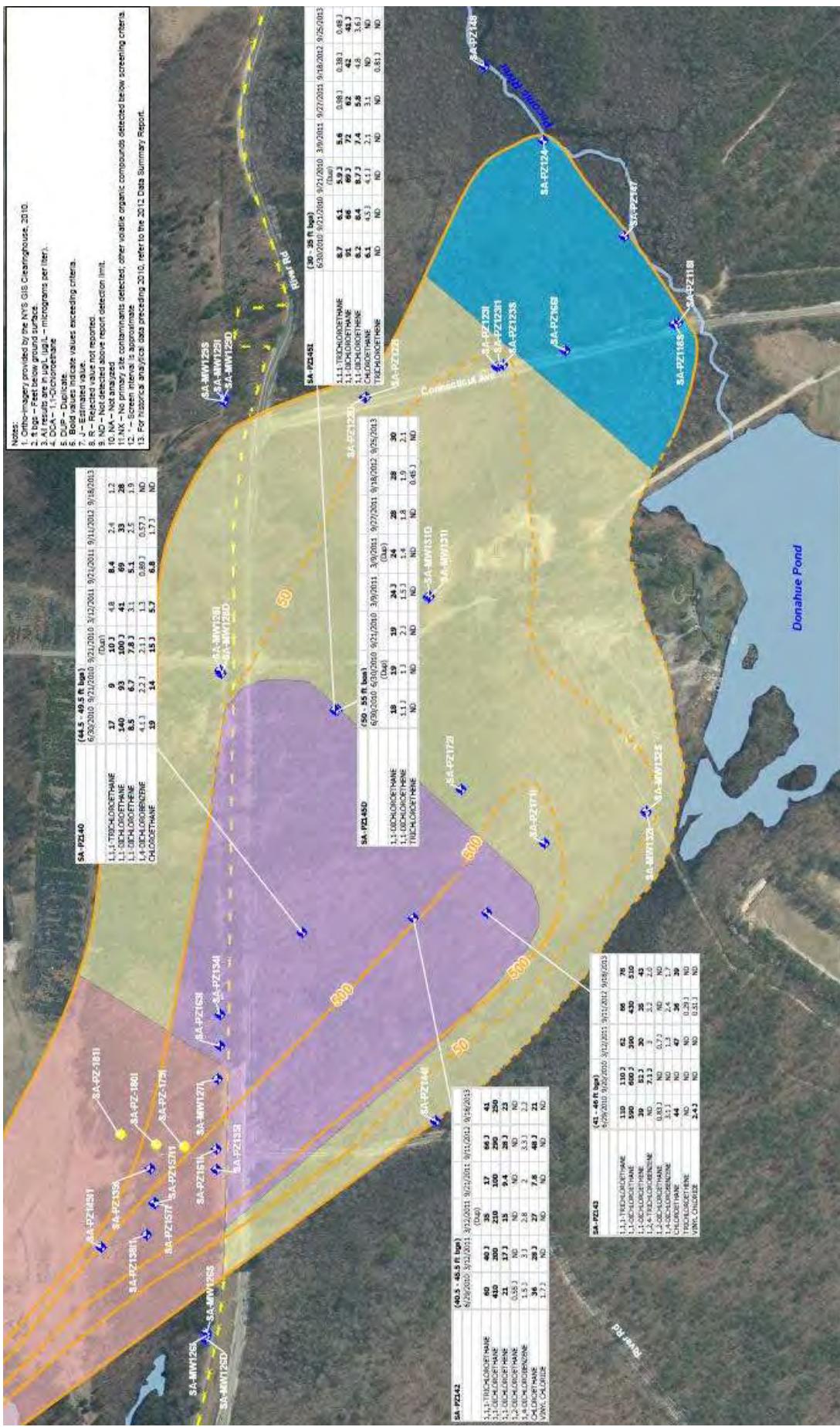
# Site 6A Source Area Results



## Fence Line Area Results



## Off-Site High Concentration Area Results





## Off-Site Low Concentration Area Results

# Peconic River Area Results



# Summary – 2013 Results



- Groundwater

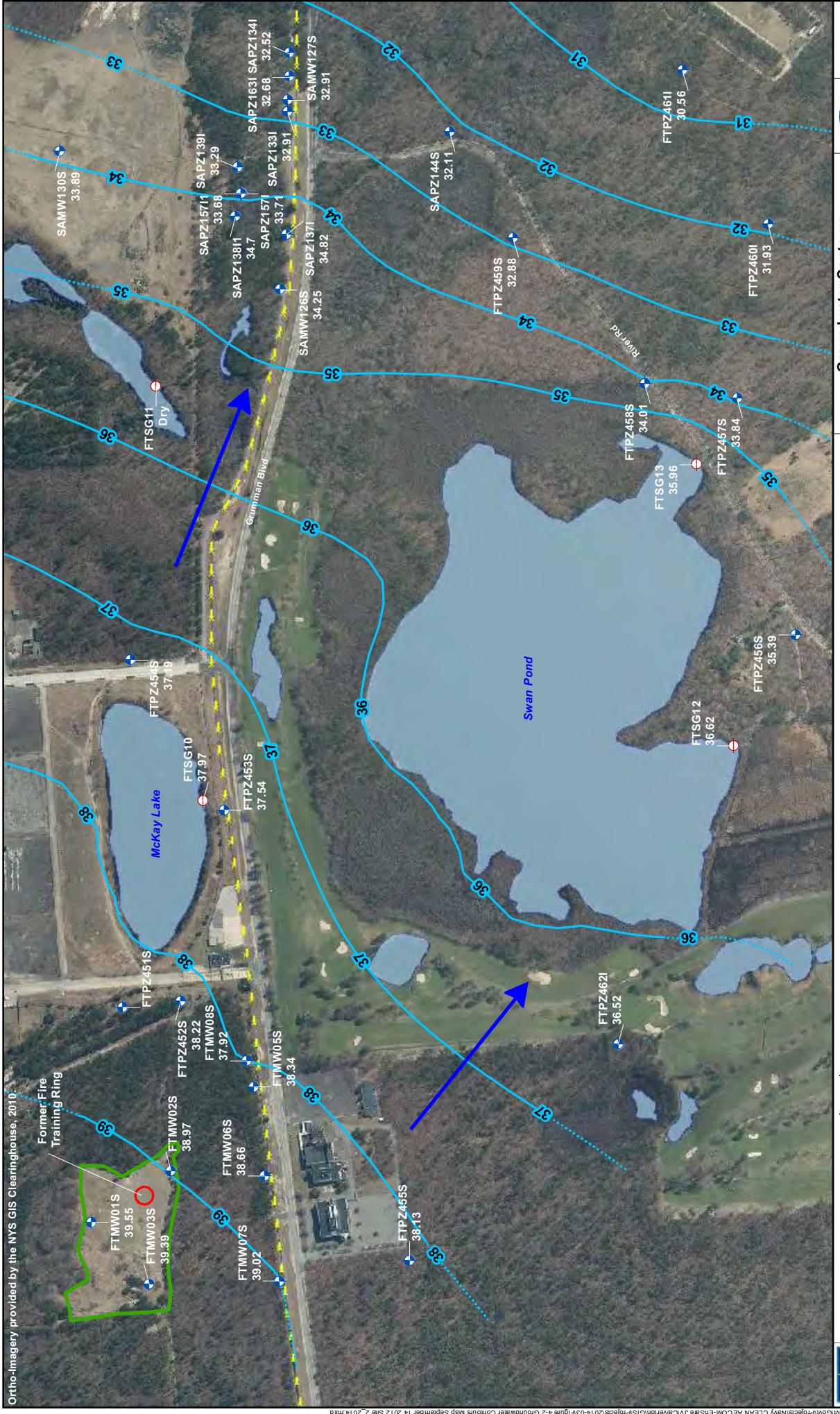
- Site 2 (Fire Training Area)
  - Trichloroethene MCL exceeded at 2 new on-site locations, but < 10 µg/L; DCA also detected but below MCL
  - Off-site exceedances of trichloroethylene MCL at 3 locations, and 1,1-DCA, 1,1-DCE, 1,2-DCE, and PCE at 1 location
    - Anomaly at FT-PZ460I continues; data consistent with prior results
- Sites 6A (Fuel Calibration Area) /10B (Engine Test House)
  - Slight increase in several VOCs at FC-MW03SR1, including 6 MCL exceedances (as compared to 2 in 2012)
  - No MCL exceedances at any other location, including the FC-MW05/09/10 “fenceline”
- Southern Area
  - Results at most locations consistent with previous round of samples
    - Increase in at SA-MW132I (1,1-DCA, 1-1, DCE and TCE) and SA-MW131I (1,1-DCA)
    - VOCs at SAPZ-149I1 remain elevated following increase seen in 2012
    - Decreases at SAPZ-135I, SA-PZ157I and SAPZ-157I



## Summary (cont'd)

- Peconic River
  - Sediment
    - VOCs detected at SA-SD124 in excess of 1,1-DCE & carbon disulfide criteria in May, and in excess of 1,1-DCE criteria in September
    - Data for two September samples (SA-SD125 and 204) rejected during validation (percent solids too low)
  - Surface Water
    - All 2013 results are non-detect or no criteria exceedance
    - DCA detected below criteria at SA-SW124 (May & September) and SA-SW204 (September only)
    - Results consistent with prior data

Ortho-Imagery provided by the NYS GIS Clearinghouse, 2010



### Legend

- Former Fire Training Ring
- Fire Training Ring
- Monitoring Well/Piezometer
- Staff Gauge
- Site Boundary
- Fence Line
- Water
- Groundwater Contour (Feet MSL)
- Groundwater Elevation (Feet MSL)
- Flow Direction

DRAFT

Groundwater Contours  
September 2013  
Site 2 - Fire Training Area  
NWIRP Calverton  
Calverton, New York

Figure 4-2  
Date: 4/4/2014  
Project #: 60264489



RESOLUTION  
CONSULTANTS



Ortho-imagery provided by the NYS GIS Clearinghouse, 2010.



Page 47  
Date: 4/4/2014  
Project #: 60264489

Grandview Control  
September 2013  
Site 6A and Southern Area  
NWIRP Calverton  
Calverton, New York

DRAFT

## Legend



Contour (Feet MSL) Elevation (Feet MSL) on

**Legend**

	Fence Line
	Water

## Monitoring Well/Piezometer Staff Gauge

The logo consists of a blue circle containing a white crosshair-like symbol, positioned above the acronym CNFFAC in red capital letters.

## Notes:

1. Ortho-imagery provided by the NYS GIS Clearinghouse, 2010.
2. ft bgs – Feet below ground surface.
3. All results are in  $\mu\text{g/L}$  ( $\mu\text{g/L}$  – micrograms per liter).
4. DCA – 1,1-Dichloroethane
5. DUP – Duplicate.
6. **BOLD** values indicate values exceeding criteria.

7. J – Estimated value.

8. R – Rejected value not reported.

9. ND – Not detected above report detection limit.

10. NA – Not analyzed

11. NI – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.

12.\* – Screen interval is approximate

13. For historical analytical data preceding 2010, refer to the 2012 Data Summary Report.

(3 - 13* ft bgs)									
9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013									
FC-MW03SR1	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	1.3 J	1.1	<b>9.3 J</b>	3.0 J	<b>25</b>				
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	1.8 J	2.9	ND	2.8 J	ND	ND	ND	ND	ND
CHLOROETHANE	ND	ND	<b>5 J</b>	4.1 J	<b>8.8</b>				
CIS-1,2-DICHLOROETHENE	<b>23</b>	<b>46</b>	<b>23 J</b>	<b>38 J</b>	<b>69</b>				
ISOPROPYLBENZENE	<b>13</b>	<b>21</b>	<b>10 J</b>	<b>17 J</b>	<b>24</b>				
M- AND P-XYLENE	<b>15</b>	<b>19</b>	ND	0.61 J	<b>33</b>				
TRICHLOROETHENE	ND	ND	ND	0.53 J	1.2				

(42 - 52* ft bgs)									
9/15/2010 3/14/2011 9/28/2011 2/20/2012 9/17/2013									
FC-MW02RI	ND								
VOCs	NX	ND							

(3 - 13* ft bgs)									
9/15/2010 3/14/2011 9/28/2011 2/20/2012 9/17/2013									
FC-MW02SR1	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	<b>16</b>	<b>8.4</b>	0.66 J	ND			
1,1-DICHLOROETHANE	<b>11</b>	<b>11</b>	1.5 J	1.4 J	3.8	3	<b>10 J</b>	0.81 J	ND
1,2-DICHLOROBENZENE	ND	ND	<b>7.3</b>	4.4	4.6	ND	ND	ND	ND
CHLOROETHANE	ND	ND	0.85 J	1.6	1.4 J	ND			
CIS-1,2-DICHLOROETHENE	<b>6.3</b>	<b>6.8</b>	4.6 J	<b>6</b>	<b>11</b>	<b>14 J</b>	1.2		
ETHYL BENZENE	ND	ND	4.1	<b>5.6</b>	<b>7.6</b>	<b>10 J</b>	1.4		
ISOPROPYLBENZENE	4.7 J	4 J	2.9	<b>25</b>	<b>29</b>	<b>52 J</b>	2.2 J		
M- AND P-XYLENE	<b>21 J</b>	<b>13 J</b>	<b>17</b>	<b>25</b>	<b>29</b>	<b>52 J</b>	ND		
OXYLINE	<b>17 J</b>	<b>12 J</b>	<b>11</b>	<b>11</b>	<b>9</b>	<b>0.90 J</b>	ND		
TETRACHLOROETHENE	ND	ND	ND	ND	0.45 J	0.55 J	ND		
TRICHLOROETHENE	ND	ND	0.5 J	0.82 J	0.57 J	ND			

Table 4-3 Groundwater Analytical Detection - Site 6A - Fuel Calibration Area

Data Summary Report

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

9/15/2010 3/13/2011 9/26/2011 9/11/2012 9/18/2013

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Notes:  
 1. Ortho-imagery provided by the NYS GIS Clearinghouse, 2010.  
 2. ft GPS – Feet below ground surface.  
 3. All results are in ug/L (micrograms per liter).  
 4. DCA – 1-Dichloroethane  
 5. DIP – Duplicate.  
 6. Bold values indicate values exceeding criteria.  
 7. J – Estimated value.  
 8. R – Rejected value not reported.  
 9. ND – Not detected above report detection limit.  
 10. NA – Not analyzed.  
 11. NX – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.  
 12. \* – Screen interval is approximate.  
 13. For historical analytical data preceding 2010, refer to the 2012 Data Summary Report.

Notes:

1. Ortho-imagery provided by the NYS GIS Clearinghouse, 2010.
2. ft bgs – Feet below ground surface.

3. All results are in  $\mu\text{g/L}$  ( $\mu\text{g/l}$  – micrograms per liter).

4. DCA – 1,1-Dichloroethane

5. DUP – Duplicate.

6. Bold values indicate values exceeding criteria.

7. J – Estimated value.

8. R – Rejected value not reported.

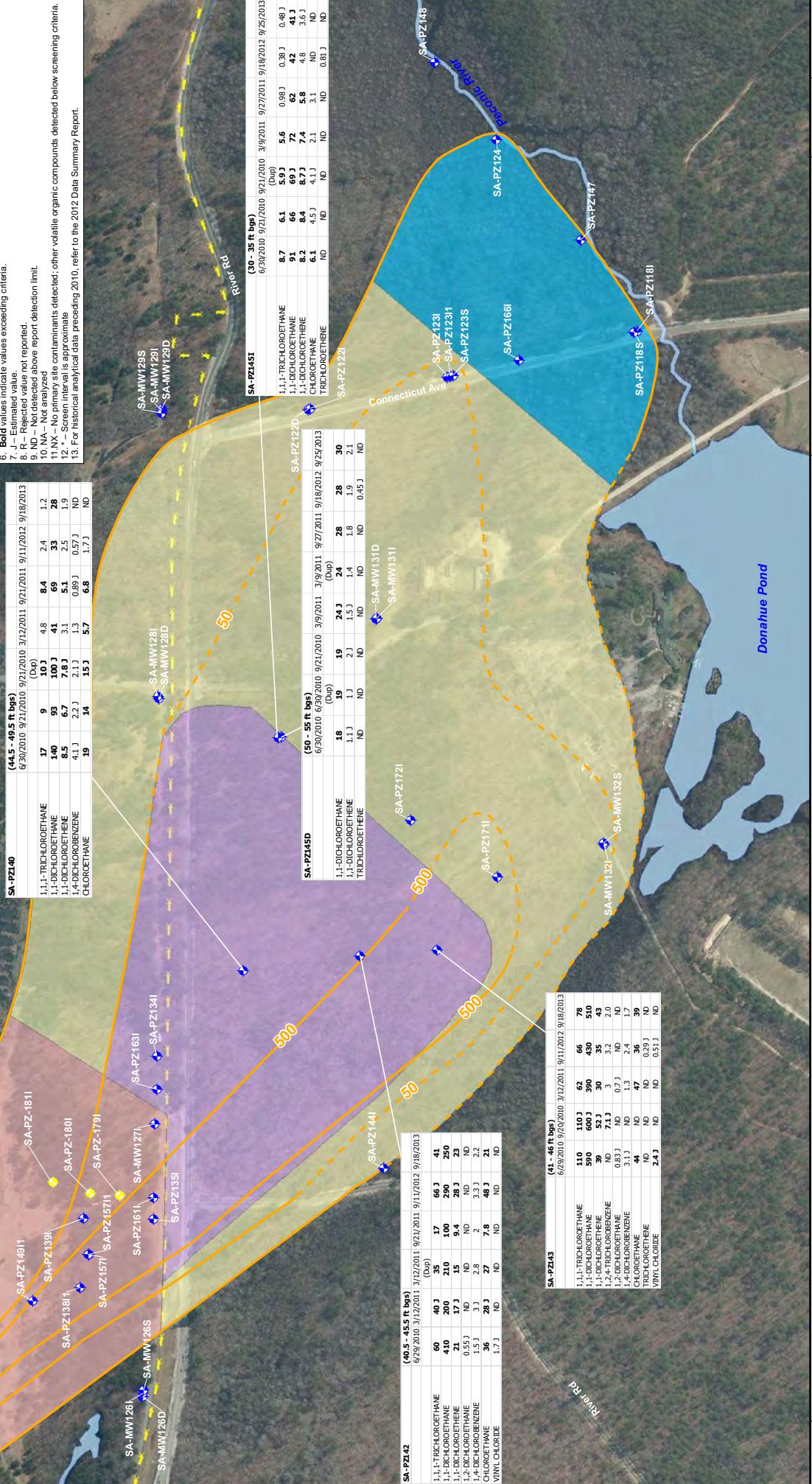
9. ND – Not detected above report detection limit.

10. NA – Not Analyzed

11. NA – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.

12. \* – Screen interval is approximate

13. For historical analytical data preceding 2010, refer to the 2012 Data Summary Report.



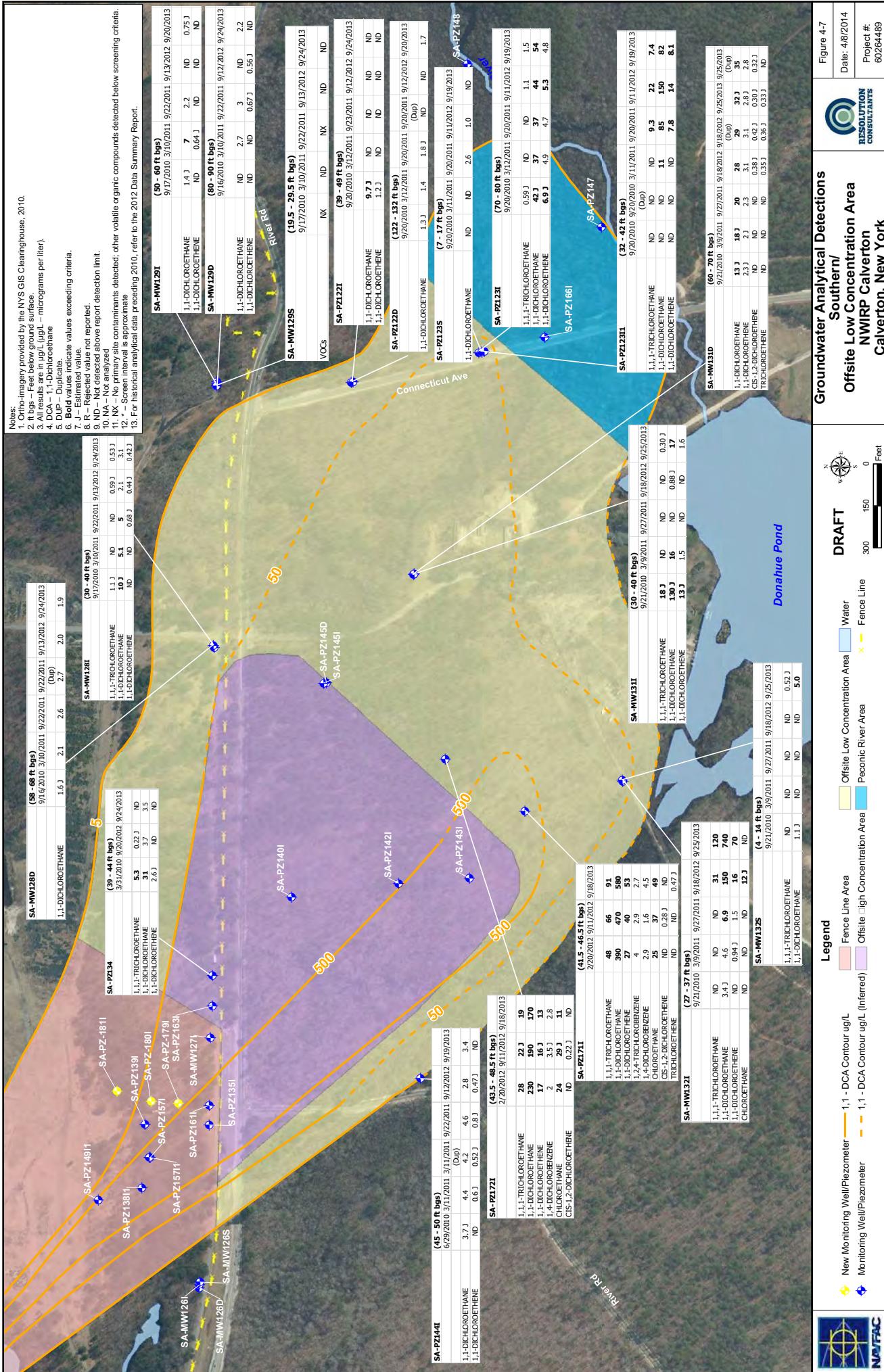
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Southern  
ite High Concentration Area  
NWIRP Calverton  
Calverton, New York

RESOLUTION  
CONSULTANTS

Figure 1c	Date: 4/8/2011	Project #: 60264489
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Figure 1-3	Date: 4/8/2014	Project #: 60264489
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SOLUTION  
CONSULTANT

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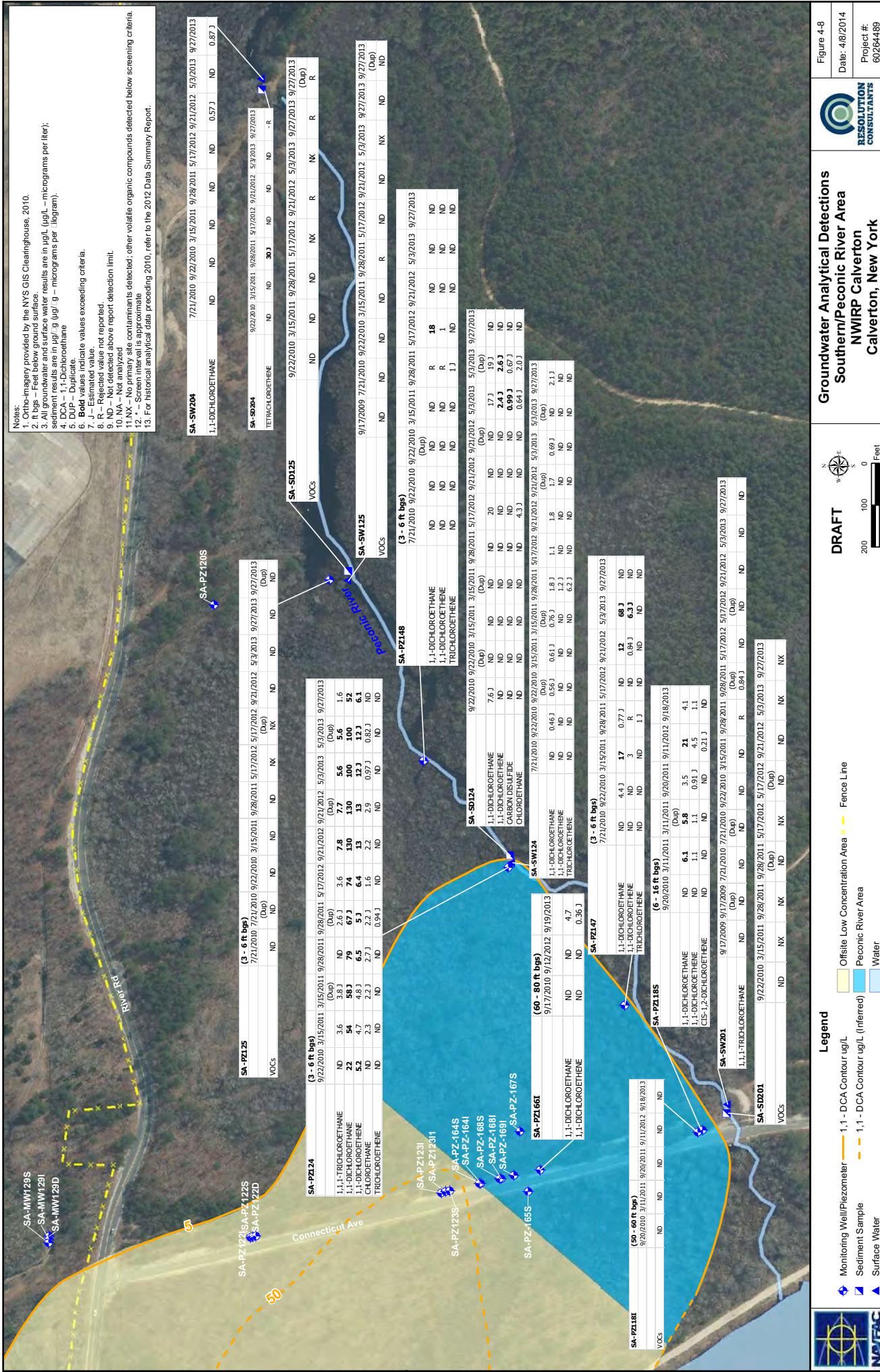


Figure 4-8	Date: 4/8/2014	Project #: 60264489
	<b>RESOLUTION CONSULTANTS</b>	