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NWIRP CALVERTON  
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MINUTES AND AGENDA FOR THE FORTY-SECOND RESTORATION ADVISORY BOARD  
(RAB) MEETING HELD ON 2 APRIL 2015 AT CALVERTON COMMUNITY CENTER NWIRP  
CALVERTON NY  
10/06/2015  
RESOLUTION CONSULTANTS

**RESTORATION ADVISORY BOARD MEETING  
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), CALVERTON  
CALVERTON COMMUNITY CENTER, CALVERTON, NEW YORK  
THURSDAY, APRIL 2, 2015**

The forty-second meeting of the Restoration Advisory Board (RAB) was held at the Calverton Community Center. Meeting attendees included representatives from the Navy (James Tarr and Joseph McCloud), New York State Department of Environmental Conservation (NYSDEC) (Henry Wilkie), Suffolk County Department of Health Services (Andrew Rapiejko), Suffolk County Legislature (Al Krupski), Town of Riverhead (Drew Dillingham), RAB Community Members (Lou Cork, Bill Gunther, Vincent Racaniello), Arcadis (Paul Martorano), Resolution Consultants (Robert Forstner, Michael Zobel), Tetra Tech (David Brayack), H&S Environmental (Jennifer Good, Al Taormina), and members of the public (Frank Anastasi, Stan Carey, Greg Fischer). 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.

**DISTRIBUTION AND APPROVAL OF MINUTES**

Mr. Tarr asked whether the RAB members received the RAB meeting minutes from the November 2014 meeting, and if there were questions or comments on the minutes. No questions or comments were raised, and the minutes for the November 2014 RAB meeting were approved.

**COMMUNITY UPDATE**

Mr. Bill Gunther began the Community Update by welcoming Al Krupski of the County Legislature, whom he described as an advocate for the environment. Mr. Krupski acknowledged the introduction, indicating he was glad to attend and that there has been great input into revitalization of the area in general and Peconic Bay in particular as a result of the RAB and the ongoing work at NWIRP Calverton.

**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.

Regarding Site 2, Mr. Tarr first provided an overall timeline of the history of recent munitions response work at the site, beginning with the discovery of 20-mm ammunition fragments during a soil investigation in 2010 and subsequent geophysical mapping conducted in 2010 and 2013, and removal actions from

2011 through 2012 and in 2014 in order to address unexploded ordnance (UXO) and munitions and explosives of concern (MEC) issues.

The most recent response action occurred between April and October 2014, and included munitions and environmental remedial activities. The munitions response operation used manual and mechanical screening to process approximately 4,100 cubic yards (CY) of soil in four areas to depths of as much as 6 feet below ground surface. A total of 689 items classified as Material Designated as Safe (MDAS) were recovered and destroyed, 323 items of Material Potentially Presenting an Explosive Hazard (MPPEH) were destroyed in a demolition event, and 65,620 pounds of metal was recovered and recycled.

The environmental remedial actions included the screening of the 4,100 CY of excavated material for site contaminants of concern (COCs); approximately 2,300 CY of this material was approved for reuse and placed as backfill across the site, and the remainder was disposed of offsite. During excavation, 17 intact or partially intact drums and about 110 drum carcasses were recovered, characterized and transported offsite. Mr. Gunther inquired as to whether the extent of the drums was expected. Mr. Tarr indicated that finding drums was expected to some degree, though it wasn't expected that there would be as many as were found, and as a result there were multiple contract modifications to allow the contractor to expand the horizontal extents of the excavation to "chase" the drums. Most were drum carcasses as opposed to drums that appeared as though they were buried full. Of the intact drums, three appeared to contain paint residue; none were found with petroleum product.

Mr. Krupski inquired as to the extent of the site restoration that was included as part of the most recent work and whether it was now suitable for public use. Mr. Tarr responded, indicating that the restoration consisted of new fill to replace excavated material. The long-term approach for the site is being developed as part of a Feasibility Study and is likely to consist of a cap with land use controls (LUCs), but that the site currently is and likely will remain restricted due to the UXO/MEC issues.

Field work for this phase of the work was completed in August 2014, and the close-out process was underway. Further excavation of recently-delineated additional MEC areas was scheduled for summer 2015.

Mr. Andrew Rapiejko (Suffolk County Department of Health Services) inquired as to whether the survey results indicating the presence of MEC north and west of the property line indicates that LUCs would be expanded, and if the Navy would always need to retain ownership of this parcel because of the UXO/MEC issues. Mr. David Brayack (Tetra Tech) responded, noting that these topics are being evaluated as part of the ongoing Feasibility Study. Mr. Brayack elaborated further, noting that it was originally thought that the site could eventually be remediated to the point where it could be certified as free of MEC, but further investigations have uncovered a more pervasive issue. It is still hoped that it may be possible to excavate the external areas beyond the property line to a point where they can be considered free of MEC, but that internal MEC areas will likely receive at least an 18 to 24 inch cap to

reduce exposure risks. Mr. Tarr added that because of the MEC issue, the Navy will err on the side of caution with regards to declaring areas free of MEC and available for reuse. Mr. Frank Anastasi asked if the Town of Riverhead was interested in the Site 2 parcel; Mr. Tarr indicated that he has not heard from the Town regarding ownership interest.

#### **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 LUCs 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.

Operating statistics and sampling data were then presented, covering a 17-month period from system startup through February 2015. System uptime and flow rates were lower in the first four months due to issues associated with system startup, but since February 2014 uptime typically exceeded 85 percent, average influent flowrates exceeded 78 gallons per minute (gpm), and in excess of 3 million gallons of water was treated monthly. September 2014 was the primary anomaly, with an uptime of only 57 percent and just under 2 million gallons treated; November 2014 was also a period of reduced productivity, with 61 percent uptime and 2.3 million gallons treated. Ms. Good also noted that although not shown on the slide, the system operated at a reduced rate in March 2015. Mr. Anastasi inquired as to the reason; Ms. Good noted it was due to the seasonally-elevated groundwater table, which limited infiltration capacity.

Regarding effluent concentrations, Mr. Brayack noted that the results have consistently been non-detect; Ms. Good further elaborated that on occasion estimated effluent concentrations of 0.5 µg/L are reported, but that this is about one-tenth of the maximum contaminant level (MCL).

Influent contaminant concentration trends were then presented. Generally, a downward trend has been observed since the system began operation. Based on the influent data, it is estimated that the system is currently removing between 1 and 2 pounds of VOCs on a monthly basis, and the cumulative removal through October 2014 was estimated at 42.30 pounds. Regarding a “blip” in the influent data for August 2014, Mr. Gunther asked there’s any sense of what the cause may have been. Mr. Brayack responded, noting that this was at extraction well EW-2, and the exact cause is unknown but it is thought that part of the issue is that EW-2 is not producing as expected, yielding only 10 to 15 gpm instead of the theoretical design capacity of 100 gpm. Mr. Anastasi asked if perhaps there was a geologic explanation for the

decreased production; Mr. Brayack explained that iron fouling is a potential cause, and replacement of the well is being considered.

Regarding a potential replacement extraction well, Mr. Rapiejko asked if it would be an additional well or a full replacement, and about where it would be located. Mr. Brayack indicated that it would be north of the existing well EW-2, which would remain in place. Regarding a question from Mr. Krupski about the depth of the wells, Mr. Brayack confirmed that the wells are screened from about 25 to 45 feet below ground surface.

Regarding the drop in influent concentrations over time, Mr. Rapiejko asked if this was due to a drop in total mass of VOCs. Mr. Brayack noted that decreasing transport of VOC mass from upgradient is a partial explanation, but the drop in influent concentrations is driven more by the fact that the capture zone of the well is such that additional clean water is being drawn in to the area. The system has been operating long enough to establish equilibrium, and the drop in influent VOC concentrations going forward will likely be more gradual.

Regarding the capture zone, Mr. Anastasi asked for clarification on how this was determined and if it is what was expected. Mr. Brayack noted that it was developed based on hydraulic properties of area soils and the design capacity of the FLTS; Mr. Tarr noted that pump tests have confirmed the actual capture zone is consistent with design expectations.

Mr. Gunther noted that a replacement extraction well was being considered, and asked for clarification on what that means. Mr. Brayack indicated that he had made a formal recommendation to the Navy that extraction well EW-2 be replaced. Mr. Tarr indicated that the Navy is evaluating the proposal in order to avoid duplicating the existing issues at EW-2 at a new well.

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

Ms. Good and Mr. Brayack 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, 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.

A summary of the historic tank areas, the layout of injection, monitoring and extraction wells, and system performance was then shown, including a figure depicting the extent of the contaminant plume shrinking over time. Routine sampling activities conducted since system shutdown (including quarterly sampling of seven wells) were then summarized, and contaminant trends were shown. It was noted that groundwater

sampling will continue through 2015, and that data will continue to be evaluated and that pre-design activities in support of enhanced treatment (particularly in the vicinity of location SV2) will be considered.

The results of soil sampling completed in 2014 were shown. Mr. Rapiejko asked for clarification on what was sampled; Ms. Good indicated all locations were sampled for polycyclic aromatic hydrocarbons (PAHs) and that some samples were also analyzed for VOCs and total petroleum hydrocarbons (TPH); Ms. Good would verify the exact locations of each type of sample. Mr. Rapiejko asked if VOCs were detected in the soil; Ms. Good indicated they were not. Mr. Brayack noted that the soil sampling was mostly a property transfer issue; since the VOCs travel readily in groundwater, the groundwater sampling is the primary means of tracking that issue. PAHs were identified in soil in the vicinity of the groundwater table.

Continuing the discussion of VOCs, Mr. Rapiejko asked if there are large areas of the site contaminated with benzene/toluene/ethylbenzene/xylene (BTEX); Mr. Brayack noted that these are tracked by groundwater sampling, and results indicate there are some near SV2. Asked by Mr. Rapiejko if it could be removed by digging, Mr. Tarr indicated that it's not a widespread issue and at this point it's believed to be mostly a residuals issue. The next step will be to evaluate ways of addressing the residuals and to see if there is a way to address the hot spots with digging, or there is an approach that could address the site holistically. The Navy will be evaluating options as a follow-up to the decommissioning of the existing AS/SVE system. Mr. Rapiejko noted that decommissioning does not mean the remaining contamination should be ignored; Mr. Tarr agreed, noting that the Navy will be looking at ongoing data in order to tailor a solution to the remaining problem.

#### **TECHNICAL PROGRESS – 2014 GROUNDWATER INVESTIGATION**

Mr. Robert Forstner (Resolution Consultants) provided a presentation on the status of the 2014 groundwater investigation, and results from that investigation. The presentation is included in Attachment 3. Sampling in 2014 was a continuation of the basewide program conducted in from 2011 through 2013, 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 and seven locations off-property), Site 6A/10B (12 locations) 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 (primarily, the New York State Department of

Health [NYSDOH] MCLs for groundwater and/or the Operable Unit 3 Remedial Design [OU3 RD] benchmarks). Detections of the primary site contaminants (e.g., 1,1-dichloroethane [DCA] and 1,1,1-trichloroethane [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 2014 was found to be approximately one foot lower than that observed in September 2013. Regarding groundwater quality, DCA and TCA levels five to six times the MCL were observed at FT-MW03S. Mr. Brayack noted that results at this well used to be in the hundreds of parts per billion, so although the recent results indicate a sharp increase in recent data, given the overall historic context these numbers are still lower than what has been observed in this area. Mr. Stan Carey noted that multiple constituents were increasing at this location; following discussion posited that this may be related to the removal of drums during the Site 2 MEC removal action, and that this area will continue to be monitored to see if these elevated numbers are a transient event or indicative of a longer-term issue. The 2014 groundwater data for Site 2 were otherwise generally consistent with recent results, and no MCLs were exceeded at any other on-property locations and most off-property locations.

Mr. Carey asked if there was any data available from west of the Fire Training Area. Mr. Tarr indicated that results in that area were not elevated and that it is not currently being monitored. Mr. Carey asked if this implied those areas are not contaminated; Mr. Tarr emphasized that is not what the absence of elevated levels indicates and no such claim was made. Mr. Brayack directed Mr. Carey to the Environmental Baseline Study (EBS) for the specific area of interest for further data in the area west of the Fire Training Area. Mr. Carey then asked about public water supply wells with VOC impacts. Mr. Brayack indicated that for more information, the EBS would be the appropriate document for reference; those studies were done in accordance with ASTM standards. Mr. Carey asked how we can be sure there is no other contamination if the groundwater is moving southeast and the furthest northwest well shows impact; Mr. Brayack indicated that prior studies used temporary wellpoints to investigate the upgradient areas, and the team is fairly confident that the source is on-site.

Mr. Rapiejko inquired about recent data from wells FT-MW09I and FT-MW10I. Mr. Forstner indicated these wells were inadvertently missed during the 2014 sampling event, but were scheduled to be resampled in the near future and that they would remain part of the annual sampling event going forward.

Discussion then moved to the area south and east of Swan Pond, where TCE exceeded its MCL at two locations. Of particular note was FT-PZ460I, where a concentration of 260 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), 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-half foot lower in elevation in 2014 than in 2013, but water levels closer to the Peconic River were generally similar to those observed in 2013. The review of the groundwater chemistry data then proceeded by subarea:

- **Source Area (Sites 6A and 10B):** There was a continued increase in concentrations of several VOCs at FC-MW03SR1 (where five compounds exceeded their MCLs in 2014, as compared to six in 2013), and at FC-MW02SR1 (where two compounds exceeded their MCLs in 2014, as compared to none in 2013). Groundwater results in this area were otherwise generally consistent with results from 2013. Although an MCL for tetrachloroethene was exceeded at FC-PZ05I1 in 2014 (after no compounds exceeded an MCL in 2013 at this location), concentrations at the “fenceline” near the well clusters FC-MW05, FC-MW09 and FC-MW10, across which the mass flux of VOCs moving downgradient from the source area is measured, continued an overall decreasing trend.
- **Fence-Line Area:** The trend in this area has been towards decreasing concentrations of VOCs over the past several years at most locations, particularly in areas further upgradient (DCA concentrations at SA-PZ157I1 have decreased from 550 µg/L in 2012 to 240 µg/L in 2013 and 130 µg/L in 2014). In the downgradient areas closer to the FLTS, concentrations of several times the MCL for DCA continue to be found.
- **Offsite High Concentration Area:** Concentrations of several VOCs (and in particular, DCA) at SA-PZ142I remain elevated. Although the 2014 DCA concentration of 100 µg/L represents a decline from the preceding two years (290 µg/L in 2012 and 250 µg/L in 2013), this concentration is still twenty times the MCL. Concentrations of DCA and DCE were otherwise stable or decreased in the Offsite High Concentration Area (in particular, DCA decreased from 28 to 6 µg/L at SA-PZ140I between 2013 and 2014, and from 41 to 32 µg/L at SA-PZ145I over the same period).
- **Offsite Low Concentration Area:** Elevated concentrations of VOCs (primarily DCA, but TCA and DCE also exceed MCLs by at least an order of magnitude) continue to be detected at SA-MW132I, although DCA has decreased from a peak of 740 µg/L in September 2013 to 500 µg/L in September 2014. Elsewhere within the Offsite Low Concentration Area, 2014 VOC concentrations (where detected) were generally consistent with or slightly below those found in 2013.

- **Peconic River Area:** DCA was found in excess of the OU3 RD benchmark in porewater at SA-PZ124 and SA-PZ147 (along the banks of the Peconic River) in May 2014, but was below the benchmark or not detected (at each location, respectively) in September 2014. Overall, seasonal (May/September) porewater VOC concentrations throughout the Peconic River Area were otherwise consistent with or slightly decreased in 2014 as compared to 2013. DCA was detected in surface water at SA-SW124 in May and September 2014, and at SA-SW204 in September 2014 only; these results did not exceed the OU3 RD benchmarks, and were consistent with intermittent detections that have previously been reported.

Some discussion regarding the analytical data followed. Mr. Rapiejko inquired about the VOC concentrations in the Site 6A source area, noting that these are being found where excavation had occurred, and asked if sampling once per year was enough to monitor this area. Mr. Brayack noted that the sampling frequency is as required by the Record of Decision (ROD), but elevated levels for two consecutive years suggest some further investigation may be warranted.

Mr. Gunther inquired about the area around SA-PZ132I, noting its location upgradient of the river and concentrations of DCA that were in the 500 to 700 µg/L range over the past few years. Mr. Brayack noted that the OU3 RD has a mechanism through which further actions may be considered. For the SA-MW132I area, in-situ biodegradation is the contingency option. Mr. Gunther also asked about groundwater velocities; Mr. Brayack noted that the geologic data indicates it should take a couple of years for groundwater from the Site 6A source area to reach the fence-line area; from the vicinity of SA-MW132I, groundwater is estimated to take six to ten years to reach the Peconic River.

## GENERAL DISCUSSION

Following completion of the formal presentations, an opportunity for further discussion of the progress at the site in general was provided. Mr. Carey asked if there is any concern about residential wells to the east of the site. Mr. Brayack responded, noting that the data indicates the groundwater discharges into the river. A profiling study looked at groundwater concentrations about a mile before the river reaches the residential wells and did not find evidence of potential impacts to the wells.

## CLOSING REMARKS

Mr. Tarr thanked the attendees for their participation, announced that he would be transferring to a different position within the Navy and that Mr. Joseph McCloud would be taking over the role of Remedial Project Manager (RPM) for the Navy. It was also announced that Mr. Gunther would be retiring from his role as the RAB community co-chair, and Mr. Tarr read a letter of appreciation from NAVFAC regarding Mr. Gunther's contribution to the RAB and the Installation Restoration process at NWIRP Calverton. Mr. Gunther thanked Mr. Tarr for the words of recognition, and noted that he hopes the new RPM understands the special value of Long Islands' groundwater resources and the Peconic River. Mr. Tarr

agreed, and noted that it is the Navy's objective to continue monitoring and remediating all sites at NWIRP Calverton to the point where they can be safely closed. Mr. Tarr then nominated Mr. Vincent Racaniello, who was present at the meeting, to succeed Mr. Gunther as the RAB community co-chair. There were no objections to the nomination of Mr. Racaniello, and he was elected to the position.

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 for the next meeting. The final date and location will be confirmed and communicated about one month prior to the meeting. The meeting was then adjourned.

**ATTACHMENT 1**  
**APRIL 2, 2015 RAB MEETING SIGN-IN SHEET**

**42<sup>nd</sup> RAB Meeting for NWIRP Calverton  
April 2, 2015  
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			
Joe McCloud			
Lou Cork			
Robert Foster			
Mike Zabel			
Andrew Radtke			
Vincent Rossmill			
Bill Gauthier			
Paul Martziano			
Henry Wickie			
Frank Anaitan			
Al Krupski			
Gresh Scotten			
Drew Dillingham			

**ATTACHMENT 2**  
**APRIL 2, 2015 RAB MEETING AGENDA**

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## **Agenda**

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

**April 2, 2015  
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**

Jen Good PG, H&S Environmental

##### **2014 Groundwater Investigation Summary**

Robert Forstner PE, Resolution Consultants

#### **Closing Remarks**

James Tarr CPG, NAVFAC Mid-Atlantic

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

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**ATTACHMENT 3**

**NAVY PRESENTATIONS – APRIL 2, 2015 RAB MEETING**



## RESTORATION ADVISORY BOARD MEETING

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

April 2, 2015

# General Overview of ER Sites



- **Sitewide**

- 2014 annual sampling program completed in May & September

- **Site 2**

- Additional excavation completed in 2014
  - Additional MEC work scheduled for 2015

- **Site 6A/10B/Southern Area**

- Fence-line system construction completed and online October 2013
  - OU3 ROD RD completed

- **Site 7**

- AS/SVE system shutdown for 2014; monitoring ongoing



**SITE 2 (FIRE TRAINING AREA)  
MUNITIONS RESPONSE**

**April 2015 Restoration Advisory Board**

**NWIRP CALVERTON, NEW YORK**

April 2, 2015

# **Site 2 Munitions Response Outline**



- Location
- Munitions Response/Remedial Action Operations
- Project Schedule

# Site 2 Location



# Site 2: Munitions Response Operation



- **Background**

- 2010 soil investigation to delineate the horizontal and vertical extent of remaining petroleum and PAH contamination
- Several (5) 20 mm fragments were found in the auger bucket of the hand auger

- **Phase I**

- Digital Geophysical mapping Survey completed in 2010
  - Identified Saturated (polygon) areas; over ~2,400 subsurface anomalies
- Explosive Safety Submission submitted in April 2011
  - Approved in May 2011; Amendment 001 Approved 2013
  - Completed Remedial/Response Action Work Plan (February 2012)

- **Phase II (May 2011 to November 2012)**

- Cleared 6.9-acre MRS 02 area of MEC and MPPEH from 0 to 18 inches below ground surface
  - Returned MEC/MPPEH-free soil back to the site
  - Over 17,000 MEC/MPPEH items identified and removed

- **Supplemental DGM survey completed in 2013**

# Site 2: Munitions Response Operation/Remedial Action

## • Phase III April 2014- October 2014

### -Munitions Response Activity (Manual/Mechanical Low Input Soil Screening)

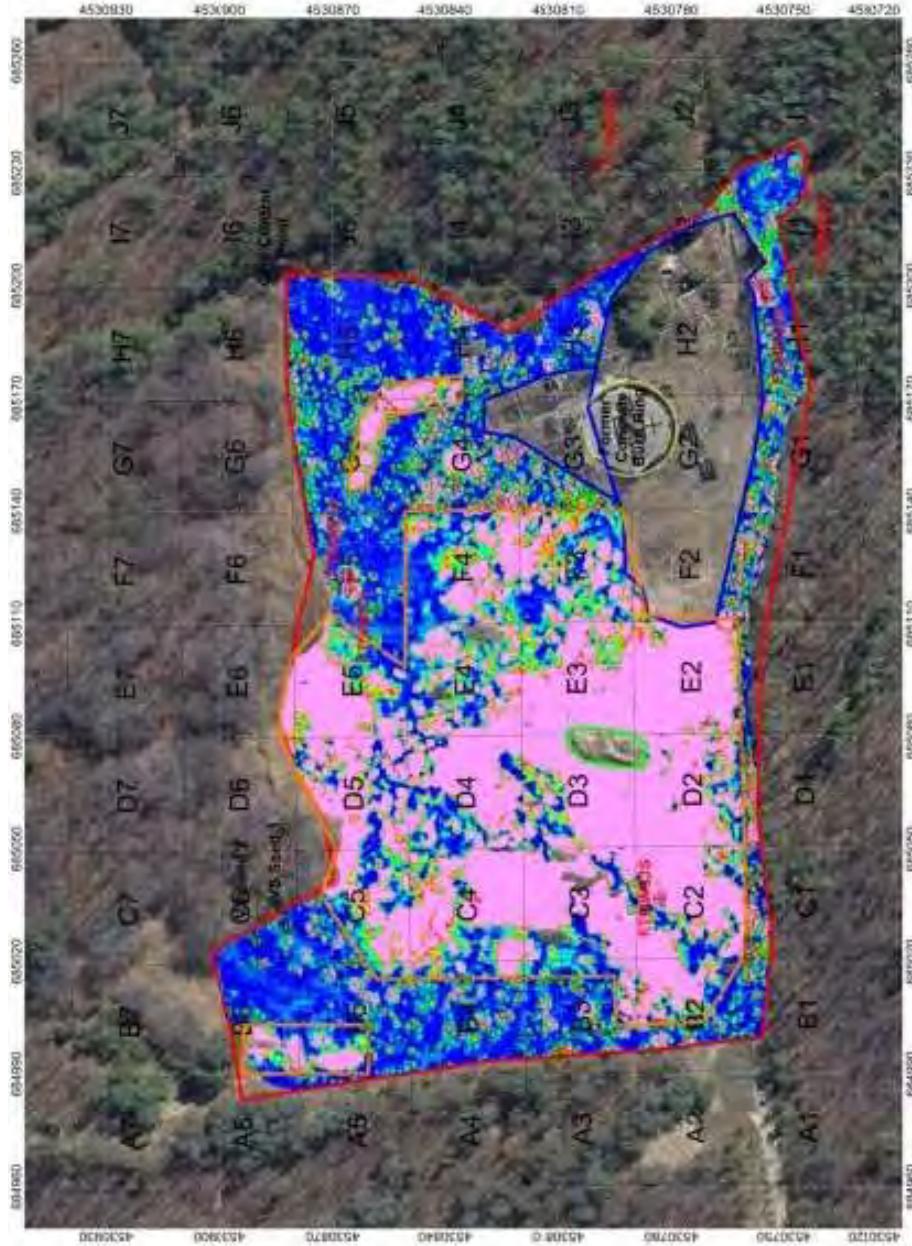
- Manual/mechanical screening & processing of ~4,100 yd<sup>3</sup> of soil in 4 grid areas up to 6 feet below ground surface
- 689 items classified as MDAS recovered and destroyed by furnace
- Completed 1 demolition event with explosives to render 323 MPPEH items safe for disposal
- 65,620 lbs. of metals recovered and recycled

### -Remedial Action

- Excavated ~4,100 yd<sup>3</sup> of potentially contaminated soil, including grids C4, G4, G3, and E2
- All excavated and screened soils analyzed for site COCs; approximately 2,300 yd<sup>3</sup> of soil approved for reuse and utilized as backfill across the site
- 17 intact or partially intact drums were removed from Grid C4; contents were characterized for disposal and transported offsite for incineration
- ~10 crushed drums/drum carcasses were removed from grid C4; characterized and transported offsite for incineration
- 2,242 tons of non-hazardous soil failed NYSDEC reuse criteria; transported offsite for disposal at Brookhaven Landfill
- Transportation and disposal of ~200 yd<sup>3</sup> of concrete comingled with non friable ACM debris



# Site 2 Digital Geophysical Map, 2010



# Site 2 Digital Geophysical Map, 2013



# Site 2 Layout Map, 2014

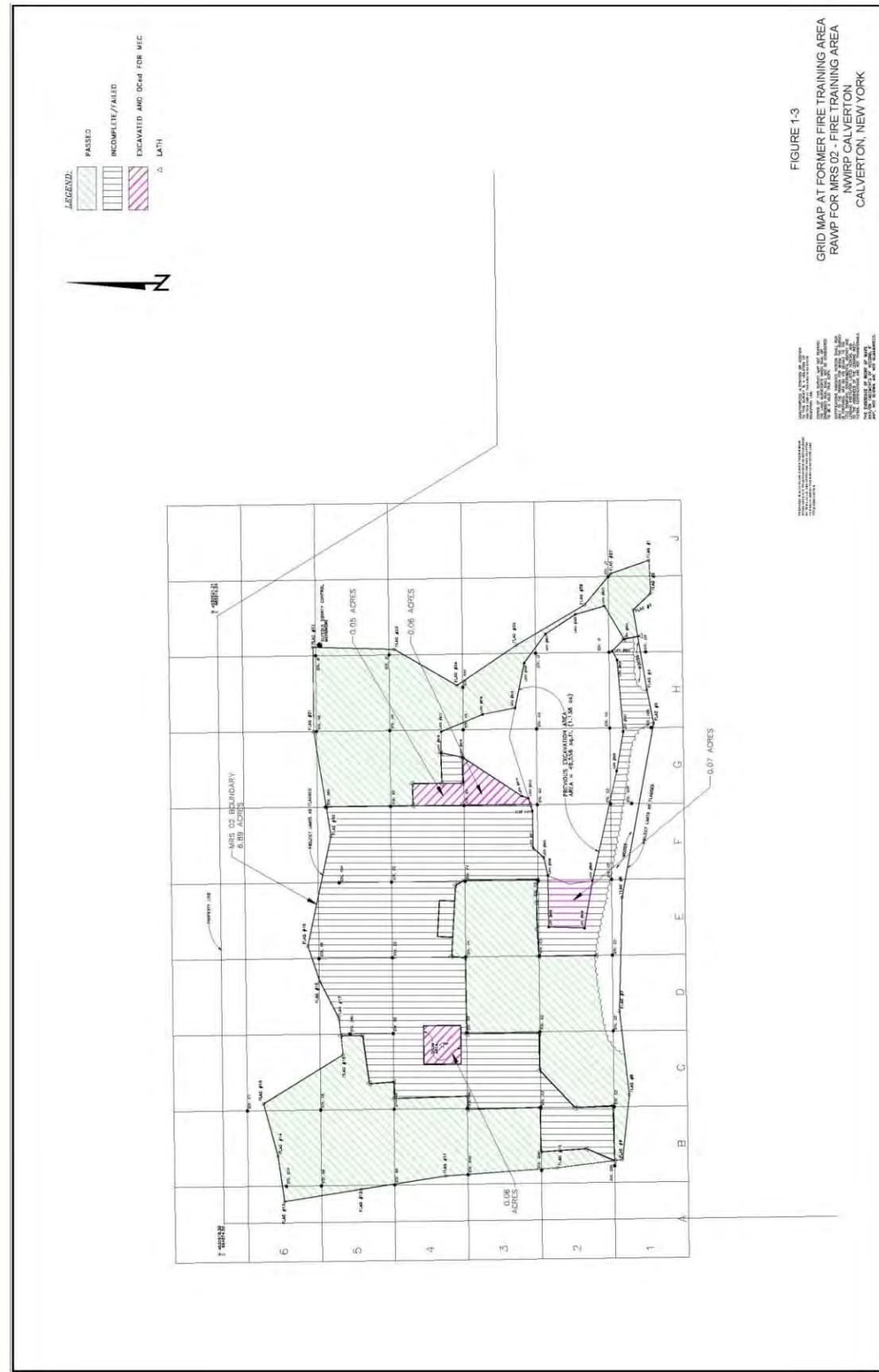


FIGURE 1-3

GRID MAP AT FORMER FIRE TRAINING AREA  
RAWP FOR MRS 02 - FIRE TRAINING AREA  
NWIRP CALVERTON  
CALVERTON, NEW YORK

# Excavation and Sampling Grid Map, 2014

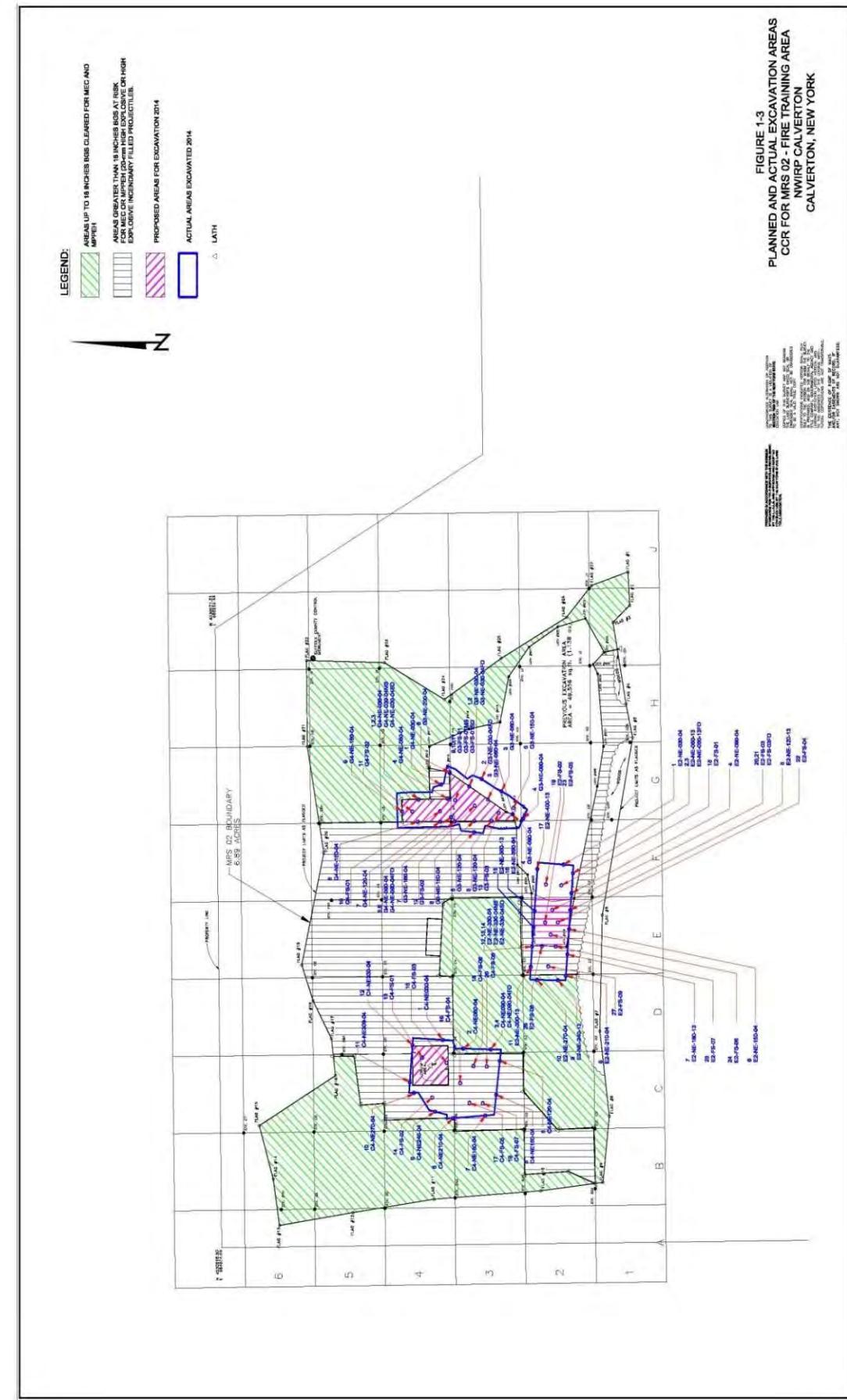


FIGURE 1-3  
PLANNED AND ACTUAL EXCAVATION AREAS  
CCR FOR MRS 02 - FIRE TRAINING AREA  
NW/RP CALVERTON  
CALVERTON, NEW YORK

## Site 2 Photo Documentation (2014)



# Current Project Schedule



- **Phase III Response Project Status – Currently in the closeout phase**

- Mobilization April 2014 (Completed)
- Mechanical Soil Screening (April 2014 – June 2014) (Completed)
- Transportation and Disposal (August 2014) (Completed)
- Site Restoration (August 2014) (Limited Completed)
- Demobilize (August 2014) (Completed)
- Load out 388.62 tons of 3"-minus concrete/ACM debris (October 2014) (Completed)
- Draft Construction Closeout Report (submitted March 2015)
- Possible Summer 2015 remobilization to continue load out of 3"-minus concrete/ACM debris

- **Future Work**

- Work in additional MEC areas schedule for summer 2015
- Feasibility Study under way



# SITE 6A - SOUTHERN AREA FENCE LINE GROUNDWATER EXTRACTION TREATMENT SYSTEM

**April 2015 Restoration Advisory Board**

**NWIRP CALVERTON, NEW YORK**

April 2, 2015

# Fence Line Treatment System 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, up to 100 gallons per minute
      - VOCs removed via air stripping
      - Treated groundwater re-injected through infiltration galleries, meeting MCLs
    - Construction began in October 2012
    - System start-up occurred 8 October 2013

# Fence Line Treatment System Overview



# Fence Line Treatment System Overview



## Treatment Plant Building



## System Components

# Fence Line Treatment System Operation

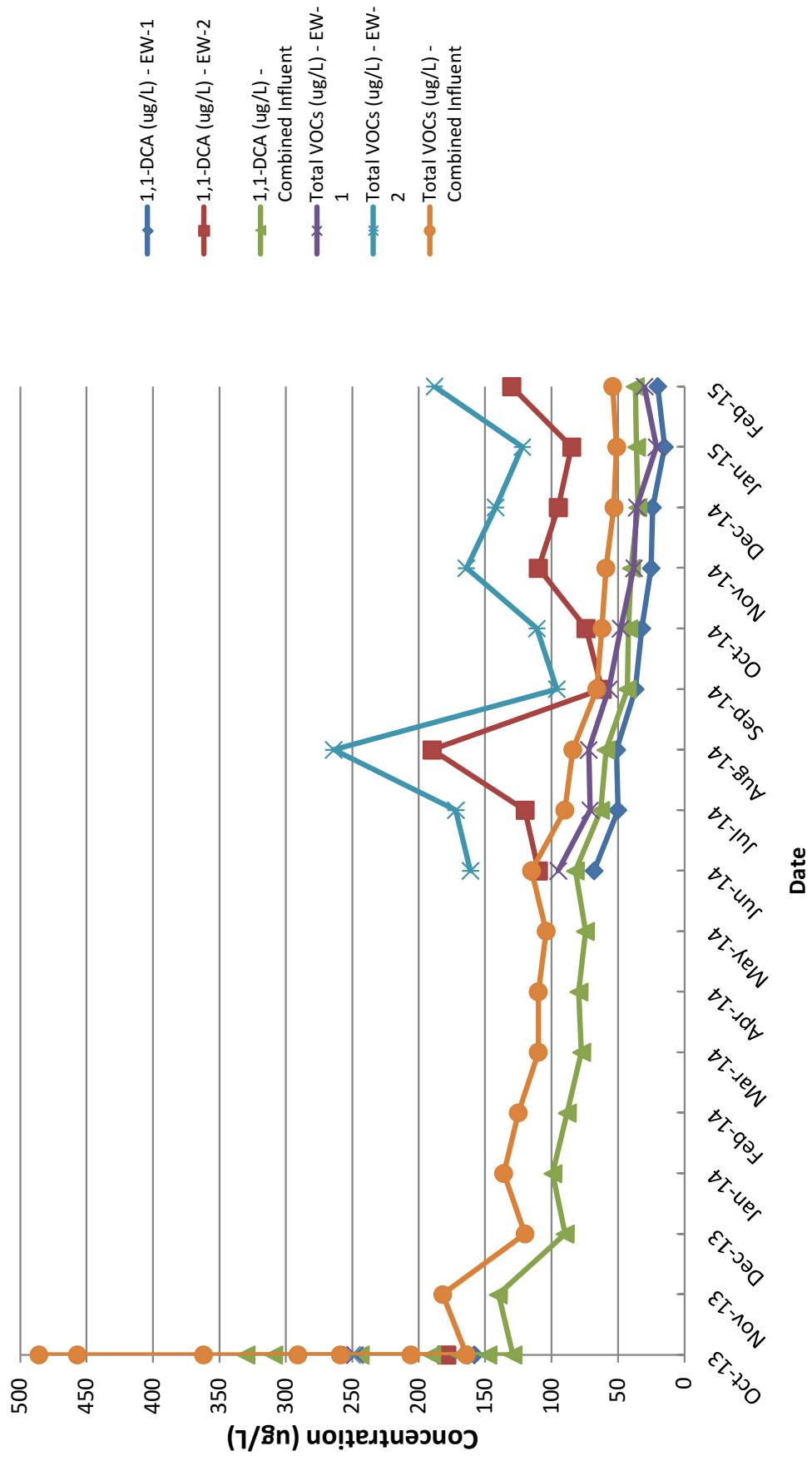


Flow Data				
Date	Total Monthly Flow (gal)	Total Cumulative Flow (gal)	Average Influent Flowrate (gpm)	Uptime (%)
Oct-13*	2,976,601	2,976,601	89.9	76.7
Nov-13	2,288,925	5,265,526	78.2	67.7
Dec-13	1,715,264	6,980,790	61.5	62.5
Jan-14	2,358,016	9,338,806	77.0	68.6
Feb-14	3,814,953	13,153,759	96.2	98.4
Mar-14	3,794,639	16,948,398	91.3	93.1
Apr-14	3,683,505	20,631,903	91.0	88.3
May-14	3,658,145	24,290,048	87.9	97.4
June-14	3,149,276	27,439,324	85.0	85.8
July-14	3,113,492	30,552,816	79.4	89.3
Aug-14	3,113,492	33,666,308	81.7	92.7
Sept-14	1,949,358	35,615,666	78.8	57.2
Oct-14	3,744,800	39,360,466	87.0	96.4
Nov-14	2,325,171	41,685,637	88.4	60.9
Dec-14	3,791,812	45,477,450	91.0	93.3
Jan-15	3,711,714	49,189,164	87.1	95.5
Feb-15	3,331,398	52,520,562	87.0	95.0

# Fence Line Treatment System Operation



## Calverton FLTS Concentration Trends



# Fence Line Treatment System Operation



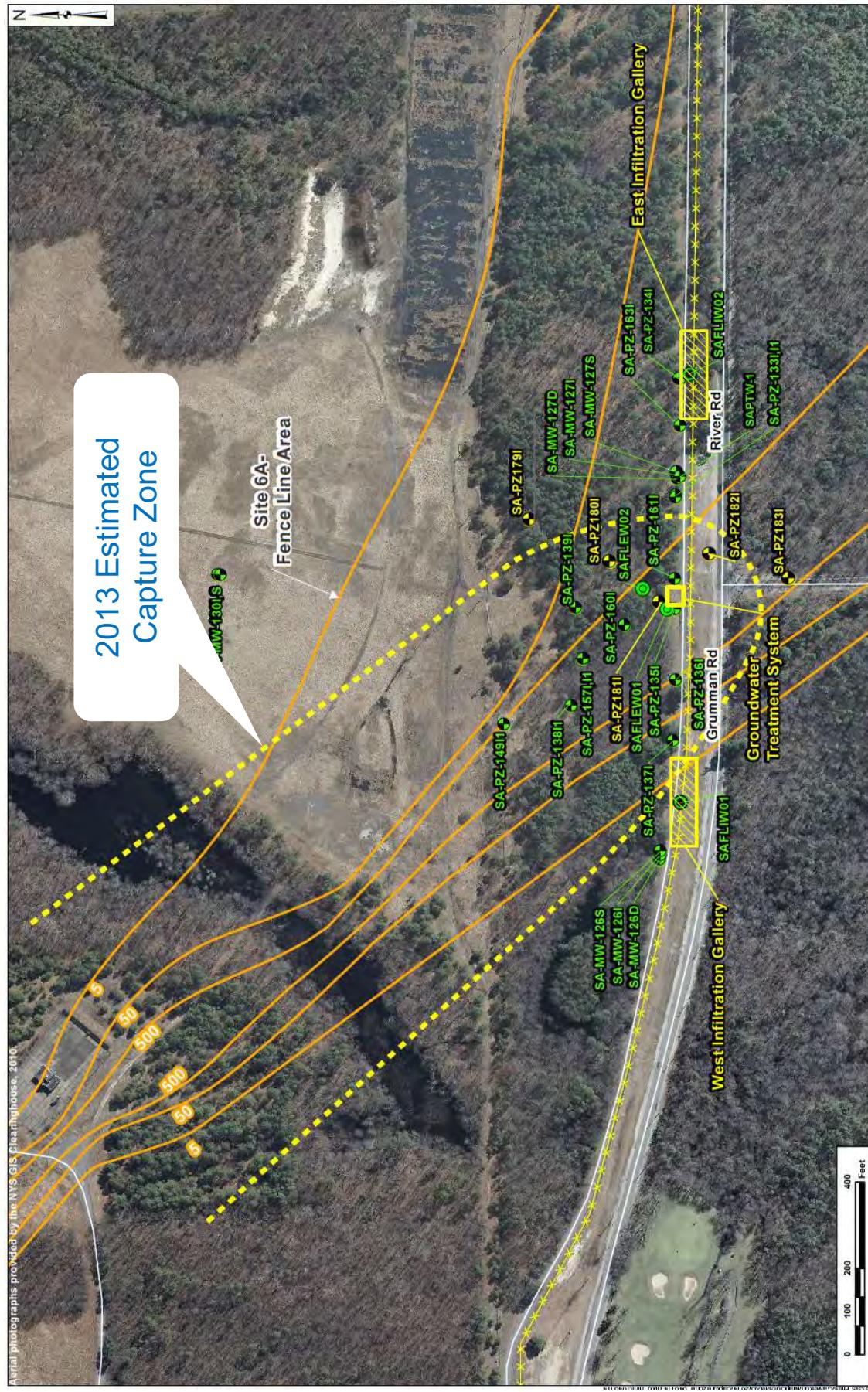
Date	Monthly VOC Mass Removal (lb)	Cumulative VOC Mass Removal (lb)
Oct-13	4.04	4.04
Nov-13	3.46	7.50
Dec-13	1.70	9.20
Jan-14	2.66	11.86
Feb-14	3.95	15.81
Mar-14	3.45	19.26
Apr-14	3.35	22.61
May-14	3.16	25.77
June-14	3.00	28.77
July-14	2.32	31.09
Aug-14	2.35	33.44
Sept-14	1.06	34.50
Oct-14	1.94	36.44
Nov-14	1.14	37.58
Dec-14	1.64	39.22
Jan-15	1.59	40.81
Feb-15	1.49	42.30

# Fence Line Treatment System – 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
  - Finalize O&M Manual
  - Evaluation of hydraulic testing data / capture zone



# Fence Line Treatment System – Capture Zone





## **SITE 7 – FUEL DEPOT AIR SPARGING/SOIL VAPOR EXTRACTION SYSTEM UPDATE**

**April 2015 Restoration Advisory Board**

**NWIRP CALVERTON, NEW YORK**

April 2, 2015

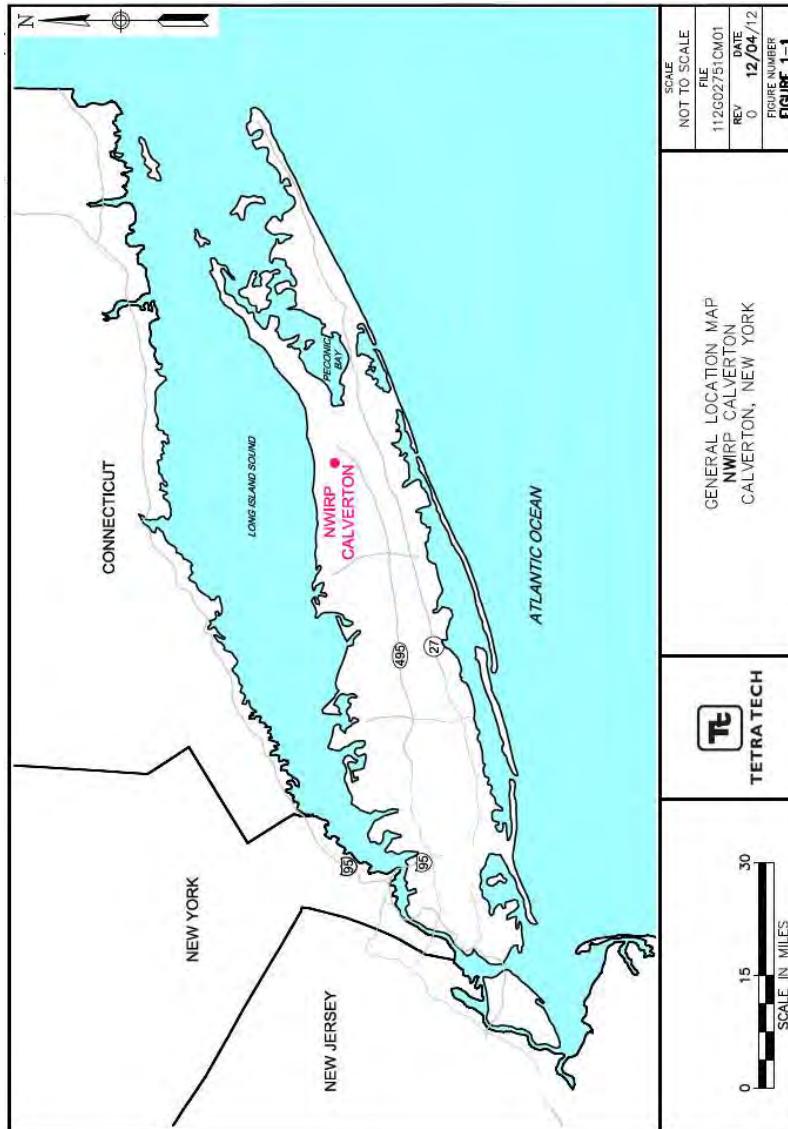
# Outline of Presentation

- **Introduction**

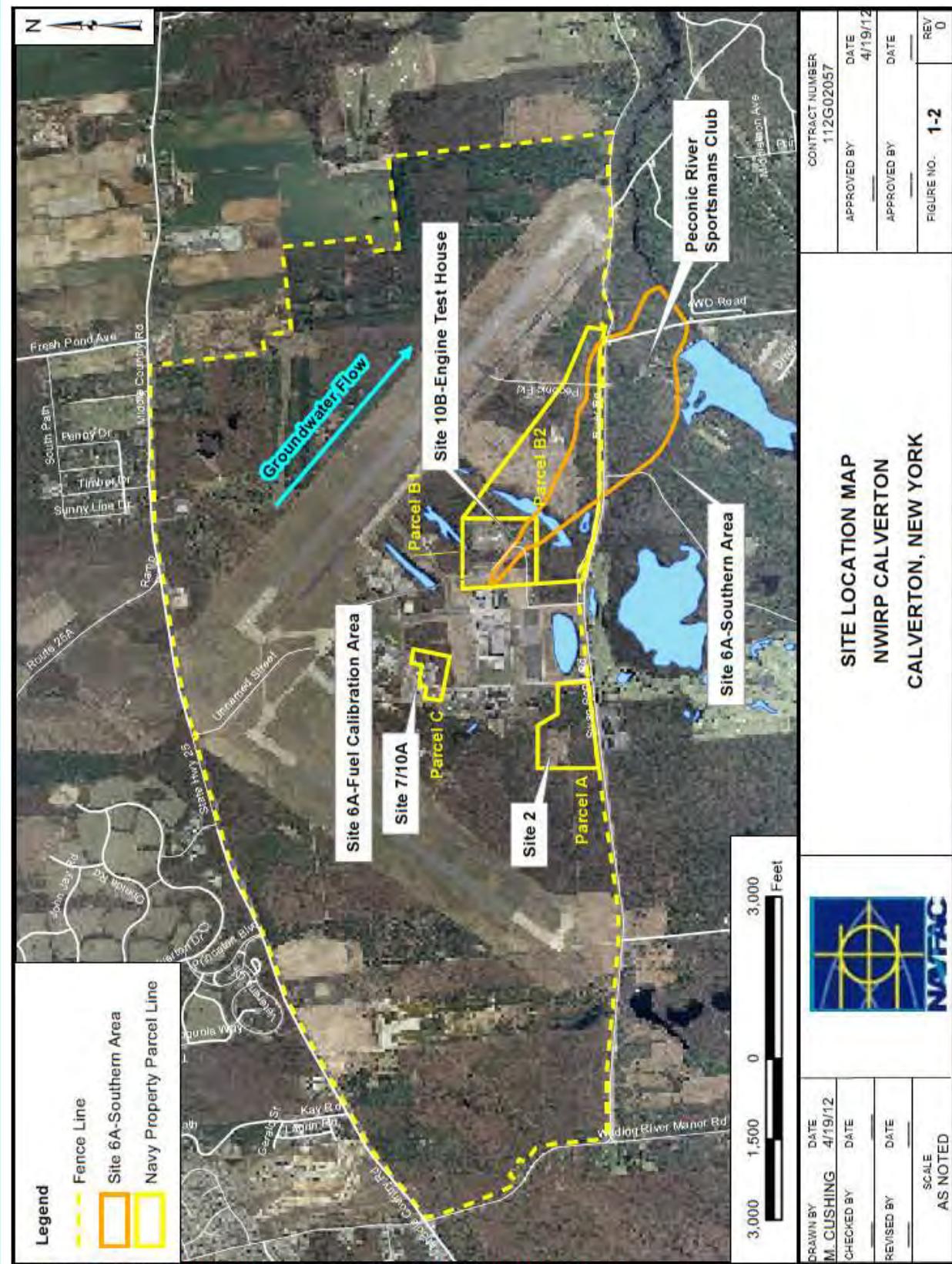
- **System Performance**

- **Recent Activities**
  - Quarterly Groundwater Sampling
  - Soil Sampling

- **Summary and Path Forward**



# Introduction



# Introduction



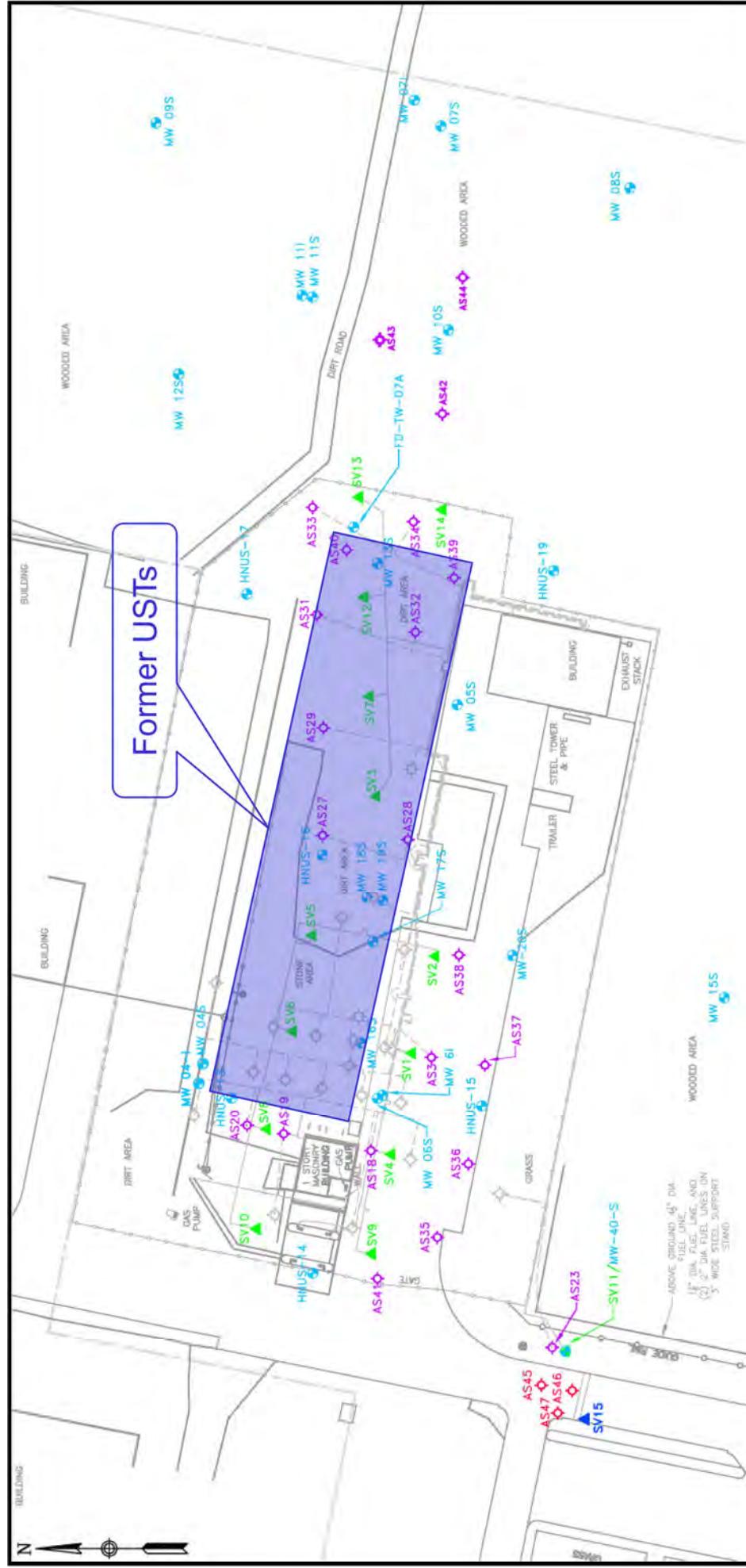
- Air Sparging/Soil Vapor Extraction (AS/SVE) system started operation in 2005 (pilot)/2006 (full scale)
- Operated seasonally (April to December) through November 2013
- Three modifications were made to the system to improve performance
  - Current system at end of its functional life
- System was shut down in November 2013 and monitoring began per the Performance and Shutdown Evaluation document (Nov 2013)



# Introduction

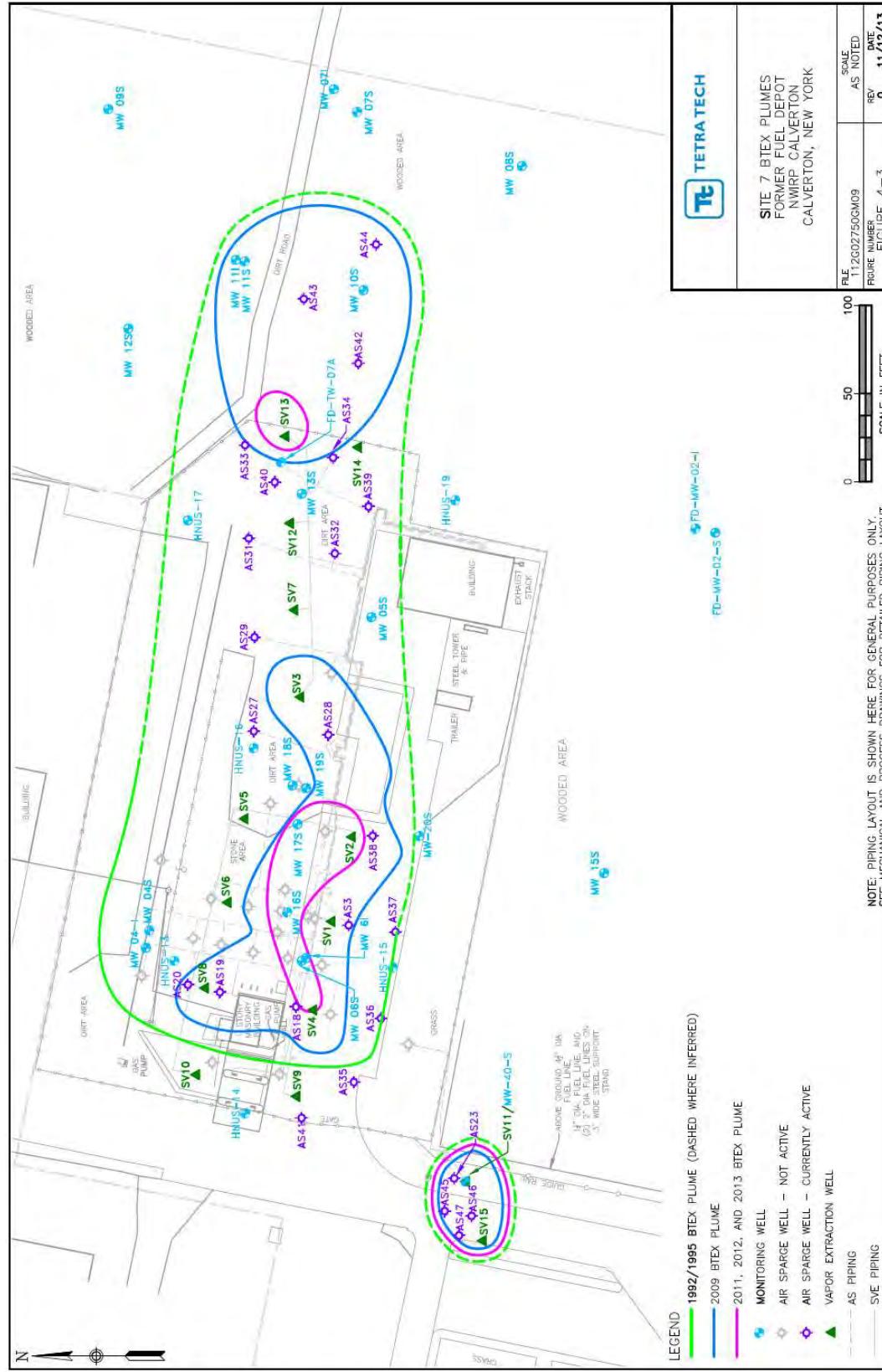


## Injection, Extraction, and Monitoring Wells



# System Performance

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



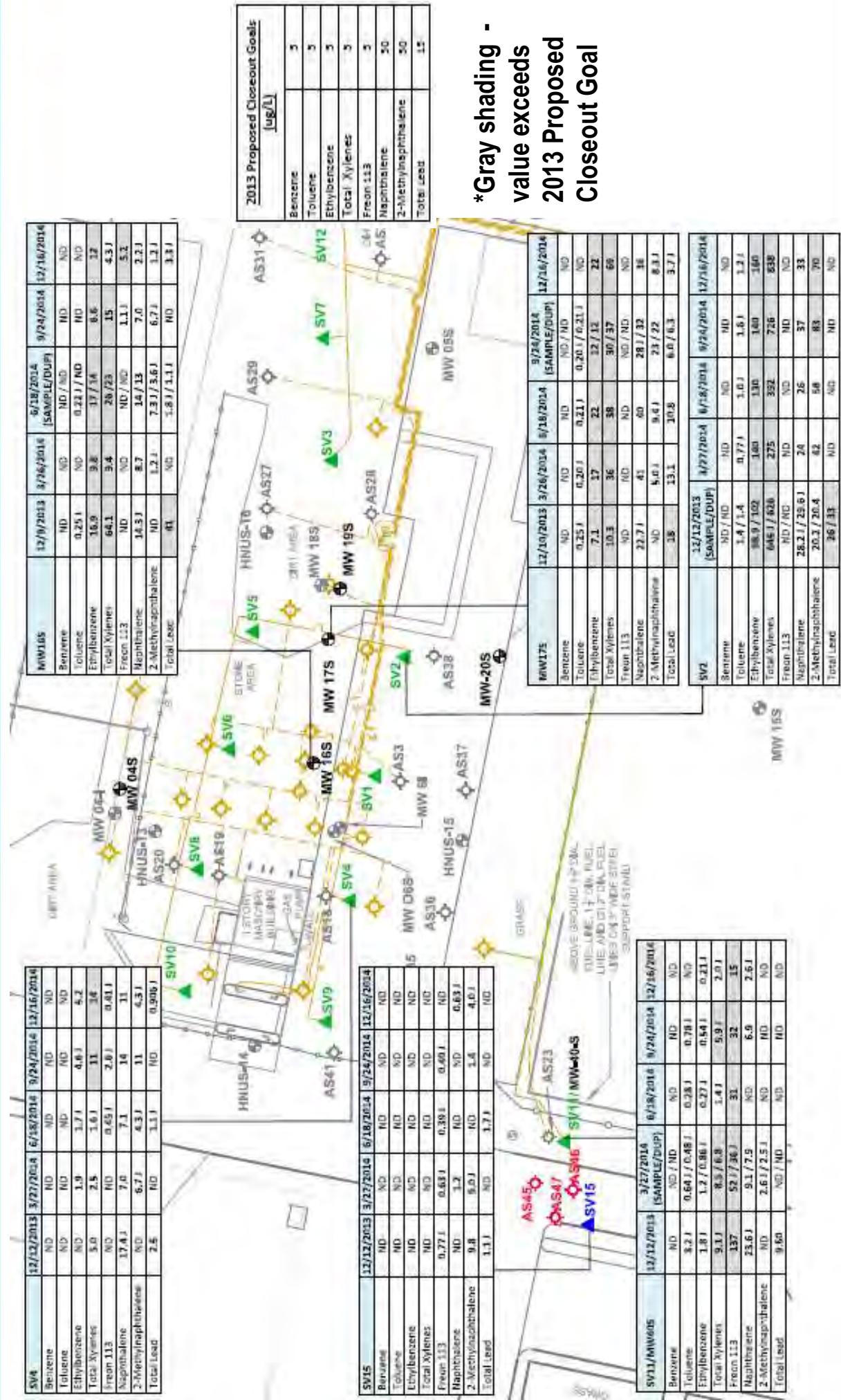
# Recent Activities



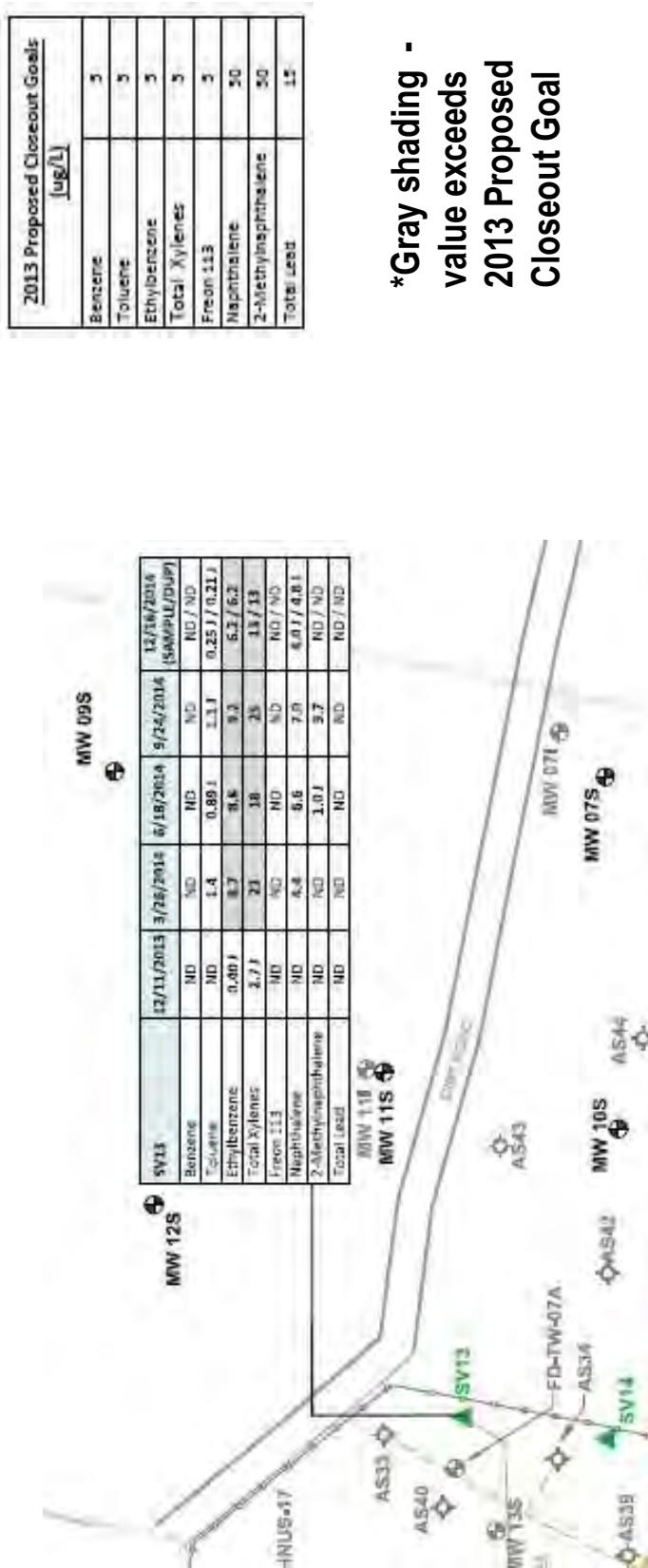
- **Seasonal groundwater sampling without system in operation**

- First round conducted in December 2013 – system down for one month prior to sample collection
  - Samples analyzed for select VOCs (BTEX, Freon, Naphthalene), methylnaphthalene, and lead
  - Quarterly sampling of 7 wells (SV2, SV4, SV11, SV13, SV15, MW16S, MW17S) which previously had exceedances of 2003 ROD Remediation Goals – March, June, September, December 2014, March 2015
  - Next event – June 2015
- **Post system startup soil data**
- 6 borings – up to 12 samples near the water table
  - Conducted in October 2014

# Quarterly Groundwater Sampling



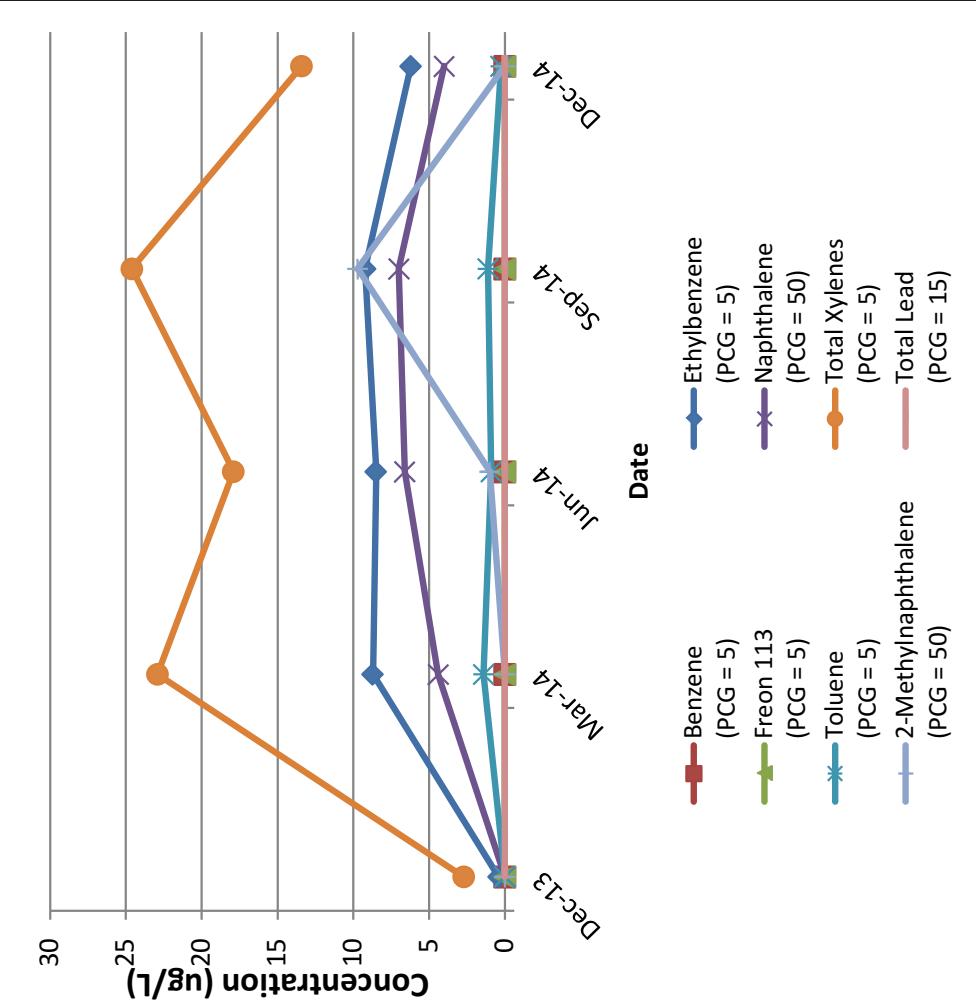
# Quarterly Groundwater Sampling



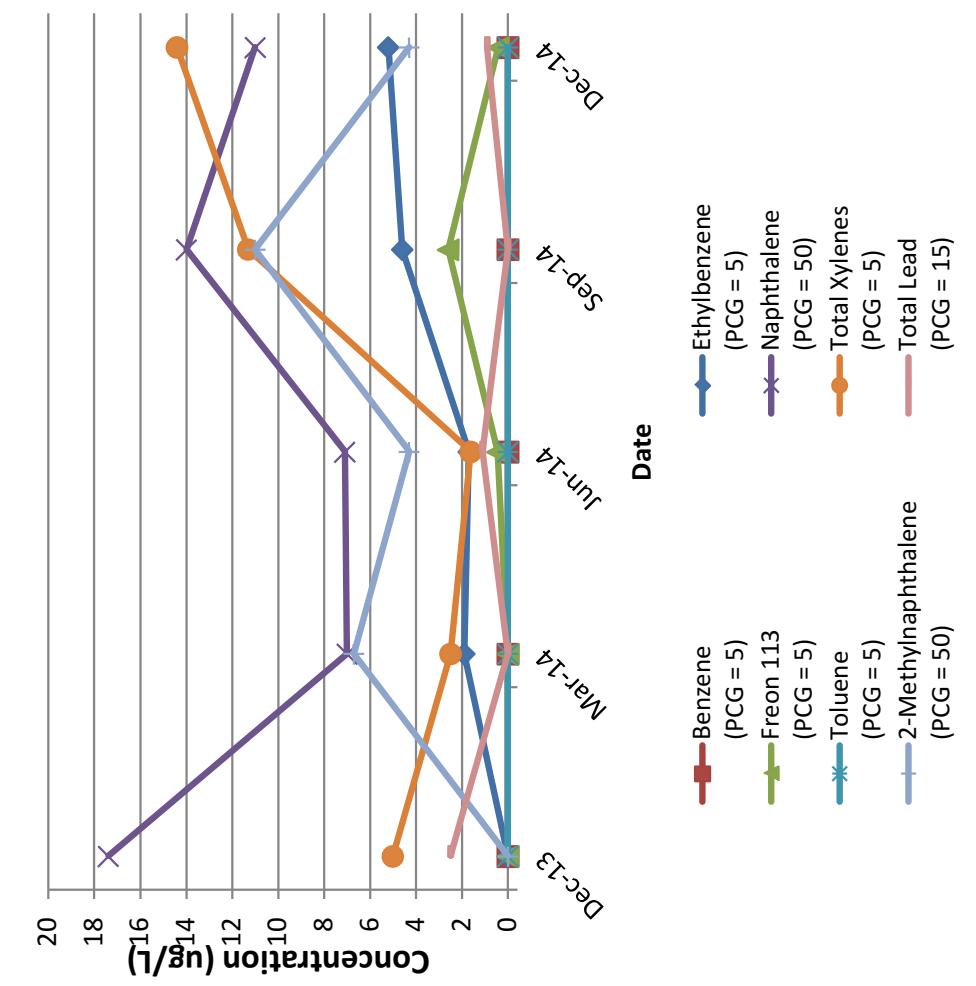
# Quarterly Groundwater Sampling



**SV13**



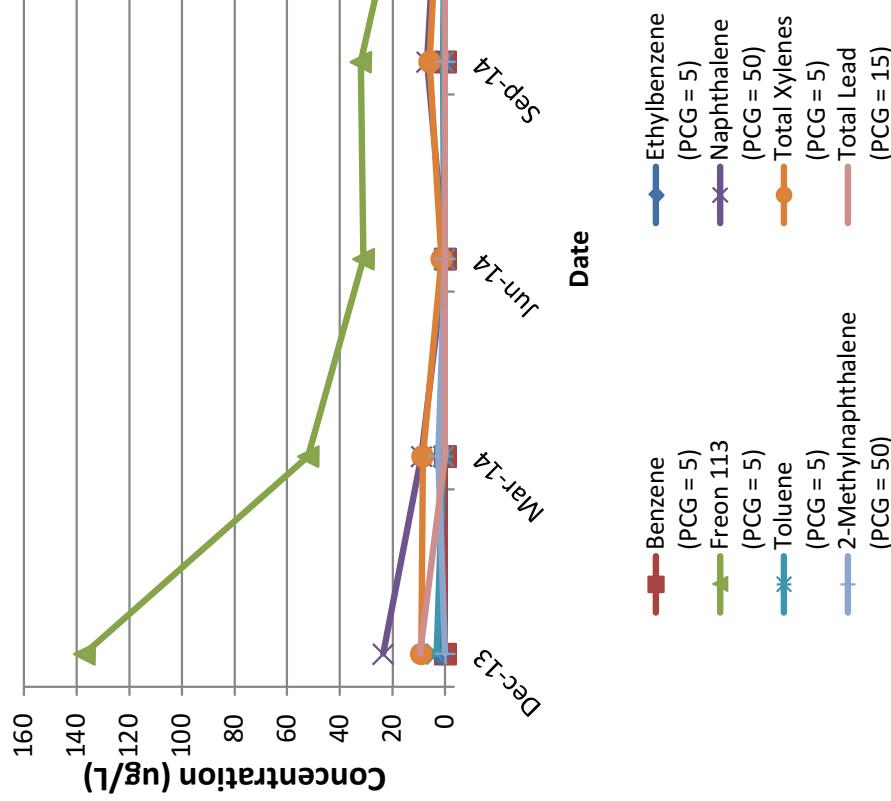
**SV4**



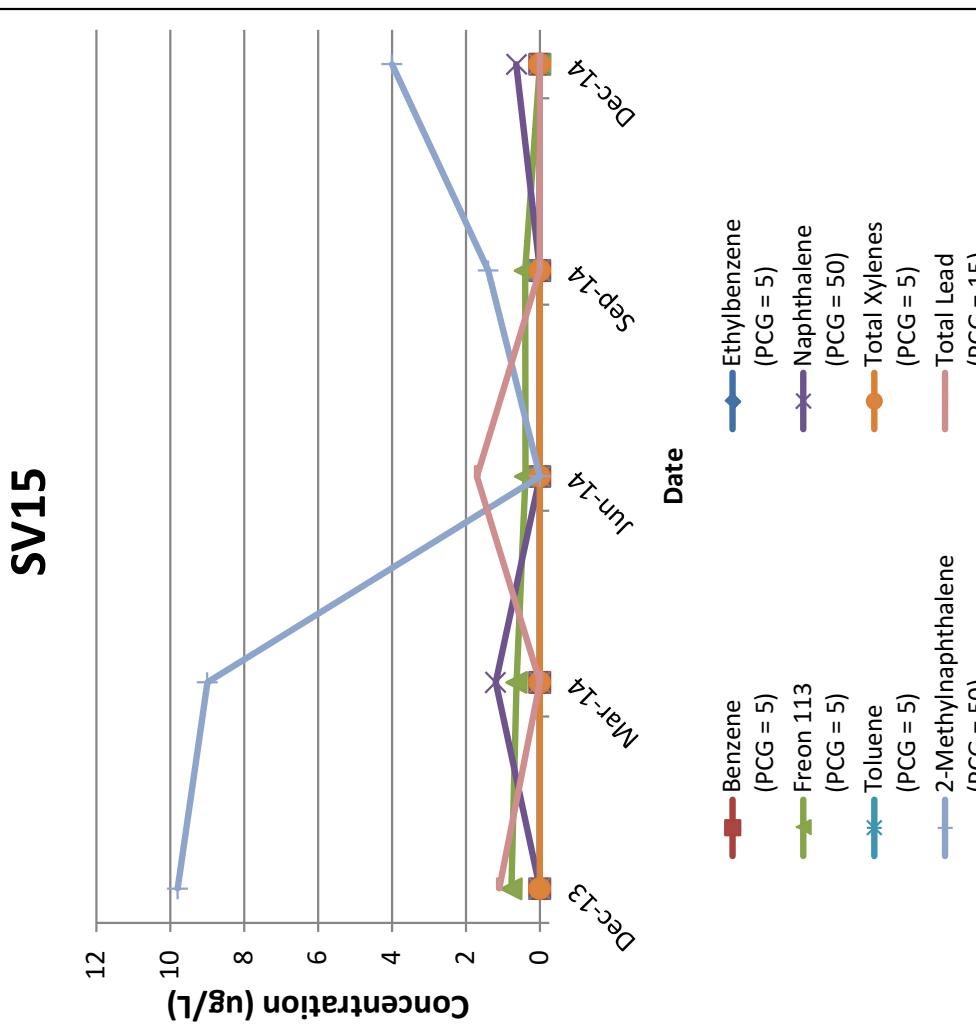
# Quarterly Groundwater Sampling



SV11



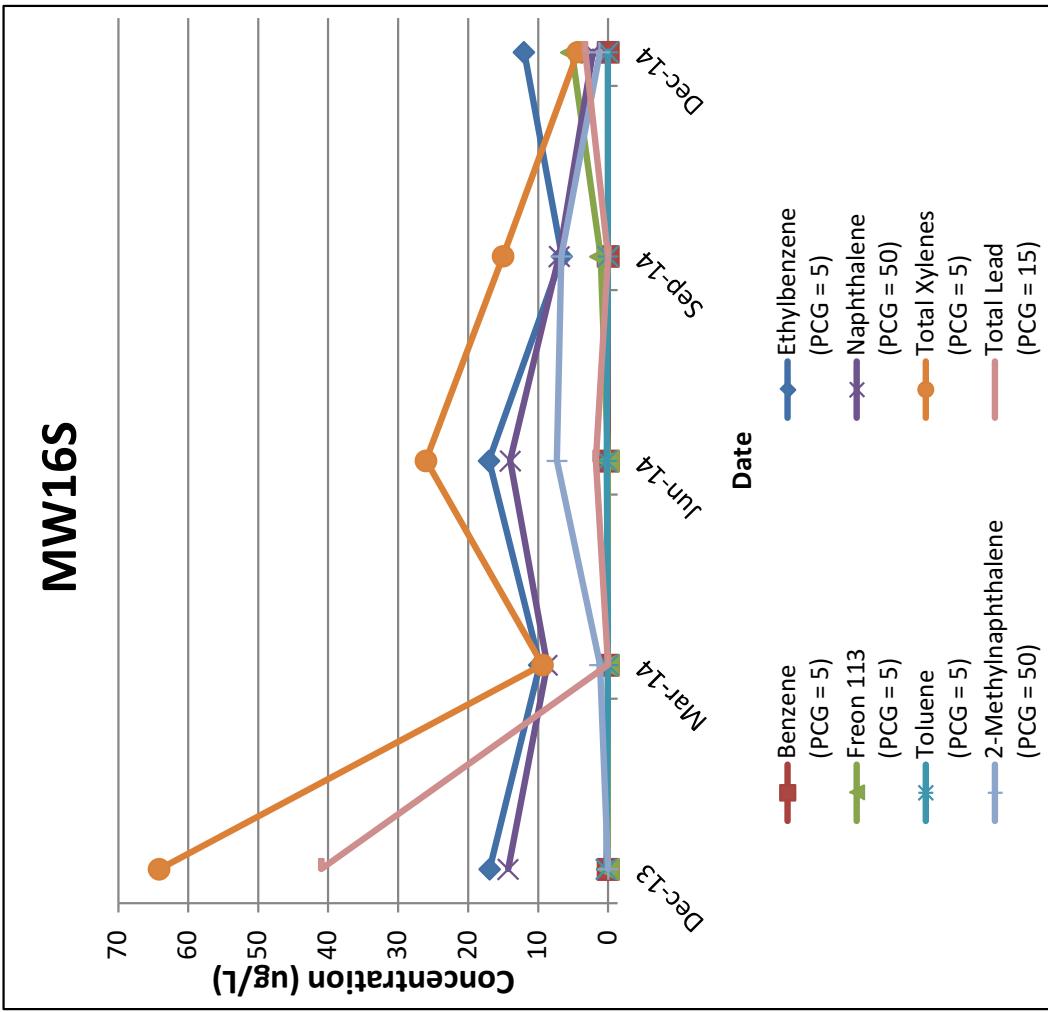
SV15



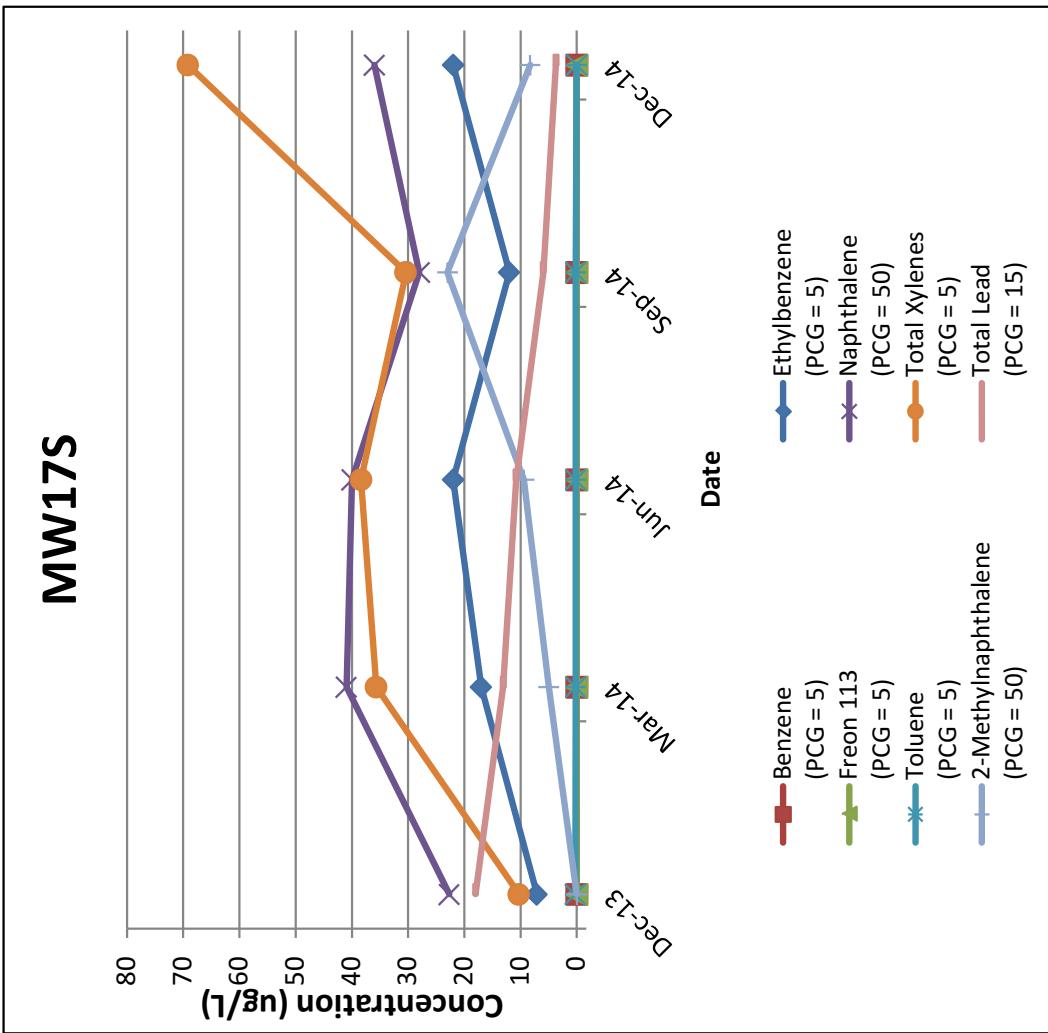
# Quarterly Groundwater Sampling



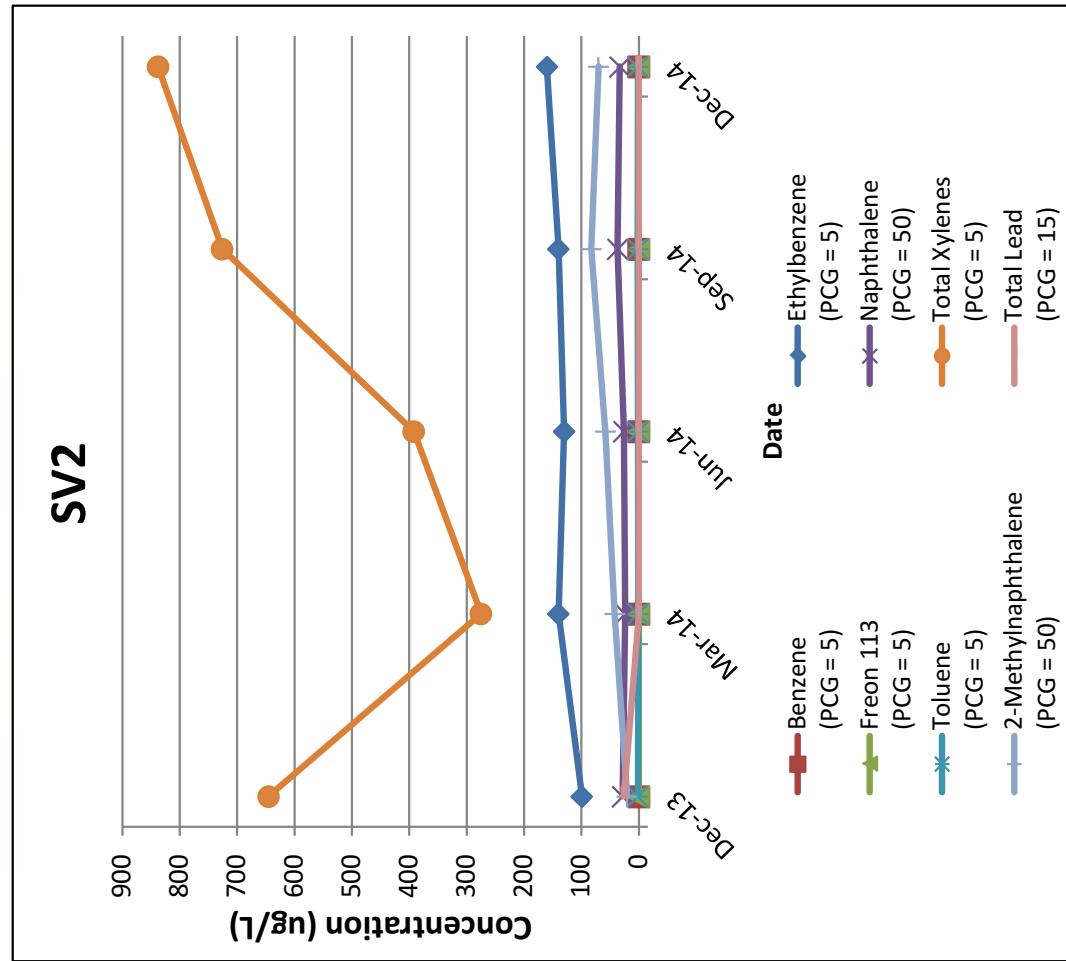
**MW16S**



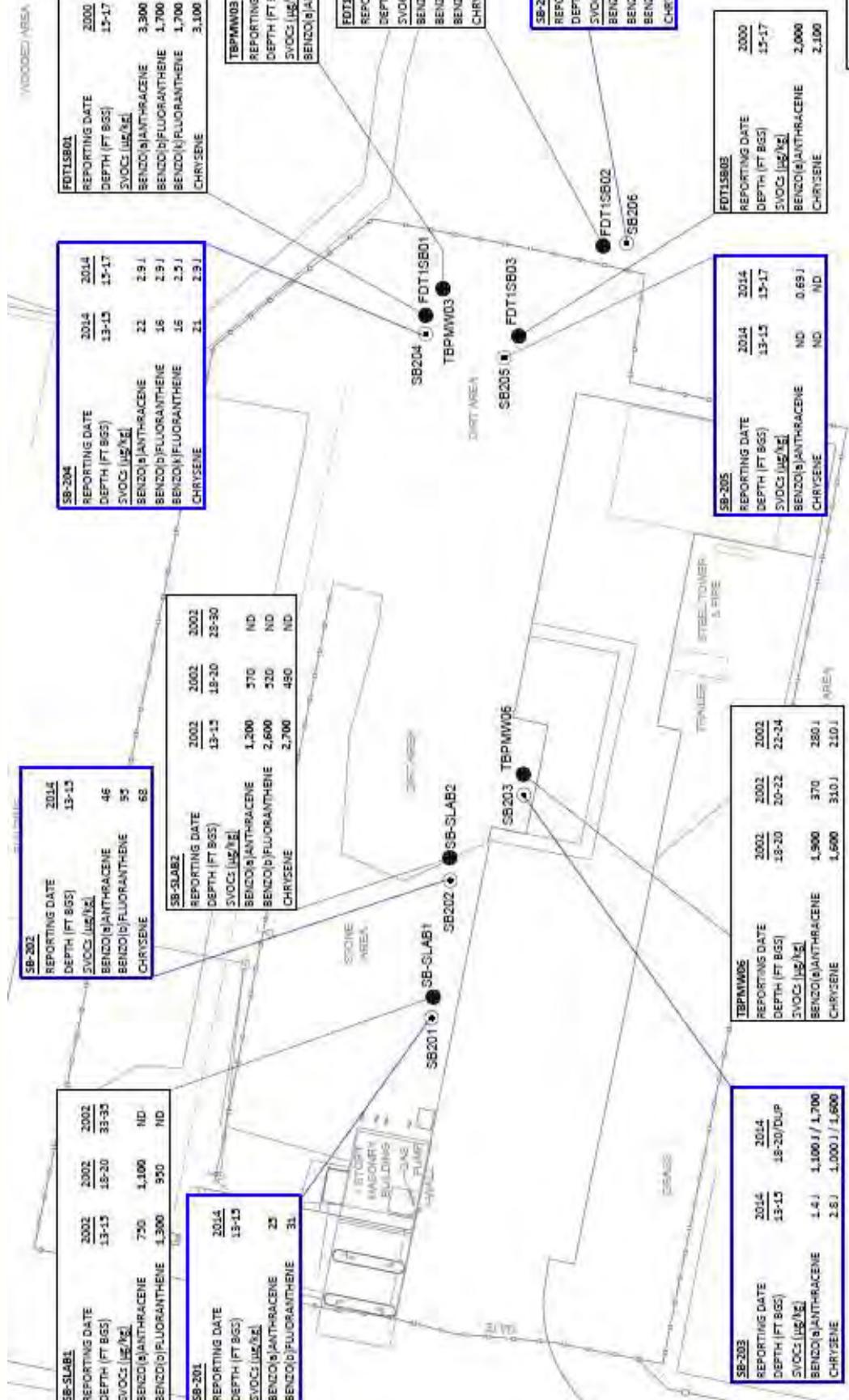
**MW17S**



# Quarterly Groundwater Sampling



# Soil Sampling



# Summary and Path Forward



- Decommissioning of current full-scale AS/SVE system
- Continue quarterly groundwater monitoring throughout FY2015/2016 with Remedial Alternative Analysis (RAA) to consider additional action (2016)



## 2014 GROUNDWATER INVESTIGATION SUMMARY

**April 2015 Restoration Advisory Board**

**NWIRP CALVERTON, NEW YORK**

April 2, 2015

# Facility Map



# Annual Monitoring Program



- **Well & Piezometer Sampling**

- 75 locations, all sampled in September 2014
- Site 2 (Fire Training Area)
  - On-property – 14 locations
  - Off-property – 7 locations
- Sites 6A (Fuel Calibration Area) / 10B (Engine Test House)
  - 12 locations
- Southern Area
  - On-site – 17 locations
  - Off-site – 18 locations
- Peconic River area – 7 locations
- **Surface Water and Sediment**
  - 4 locations, all sampled in May and September 2014
  - Co-located surface water & sediment samples (plus 4 in-river piezometers)
- **Water Elevation Gauging**
  - 103 wells/piezometers (10 not measured due to damage/access)
  - 7 staff gauges (1 not measured due to damage)

# Site 2 Groundwater Flow (September 2013)

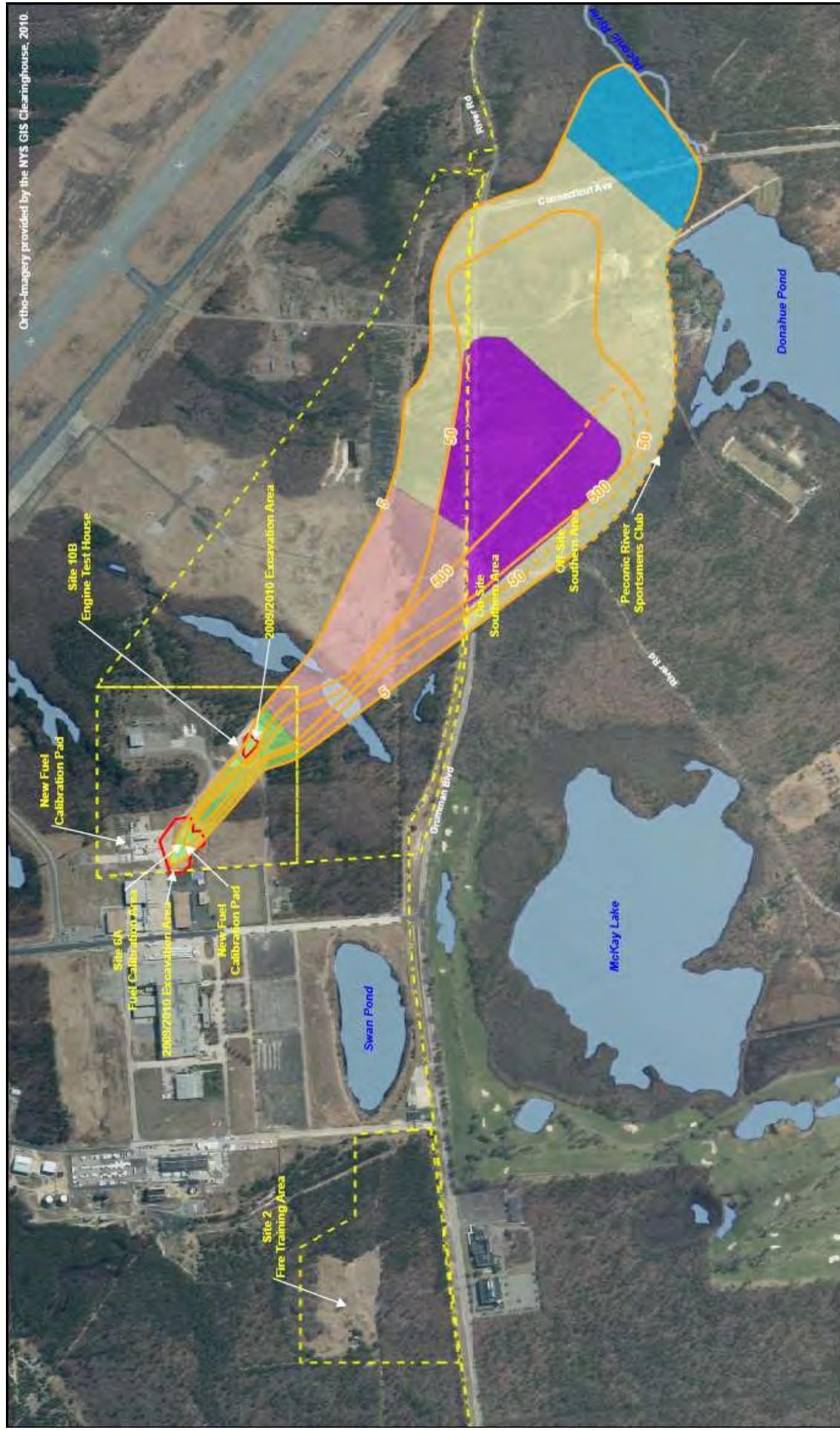


## Site 2 Groundwater Flow (September 2014)





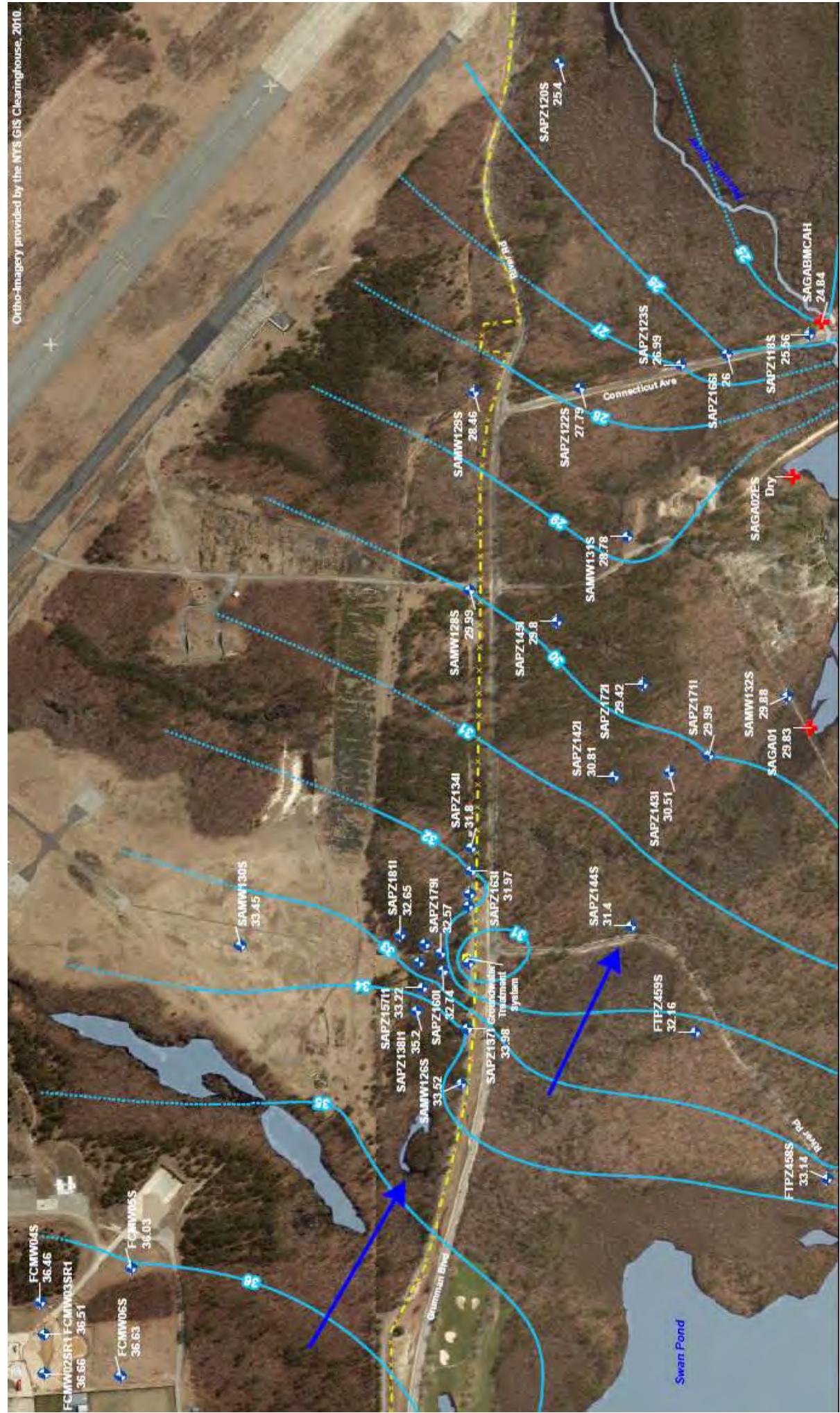
# Southern Area Plume Map



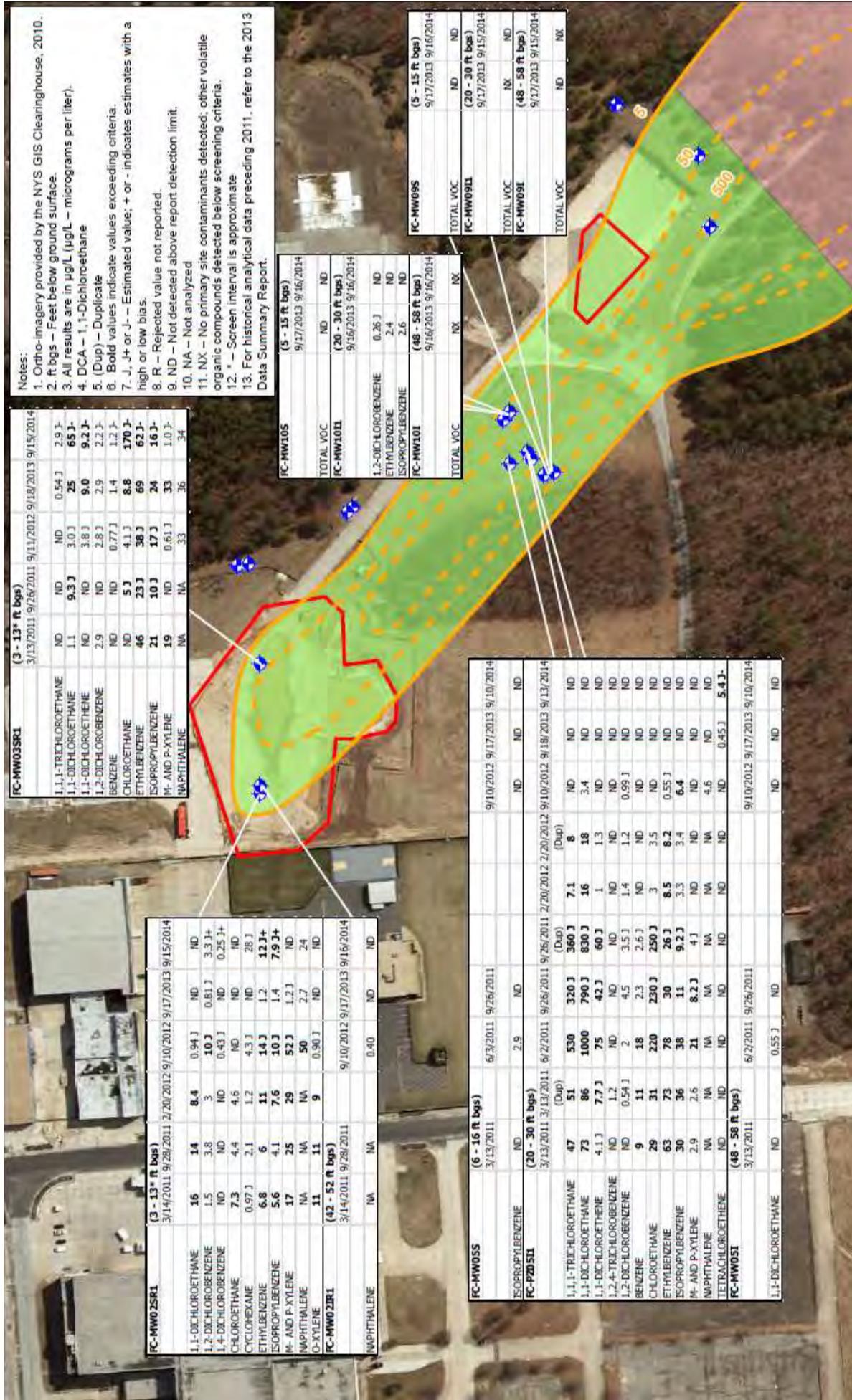


# Groundwater Flow (September 2013)

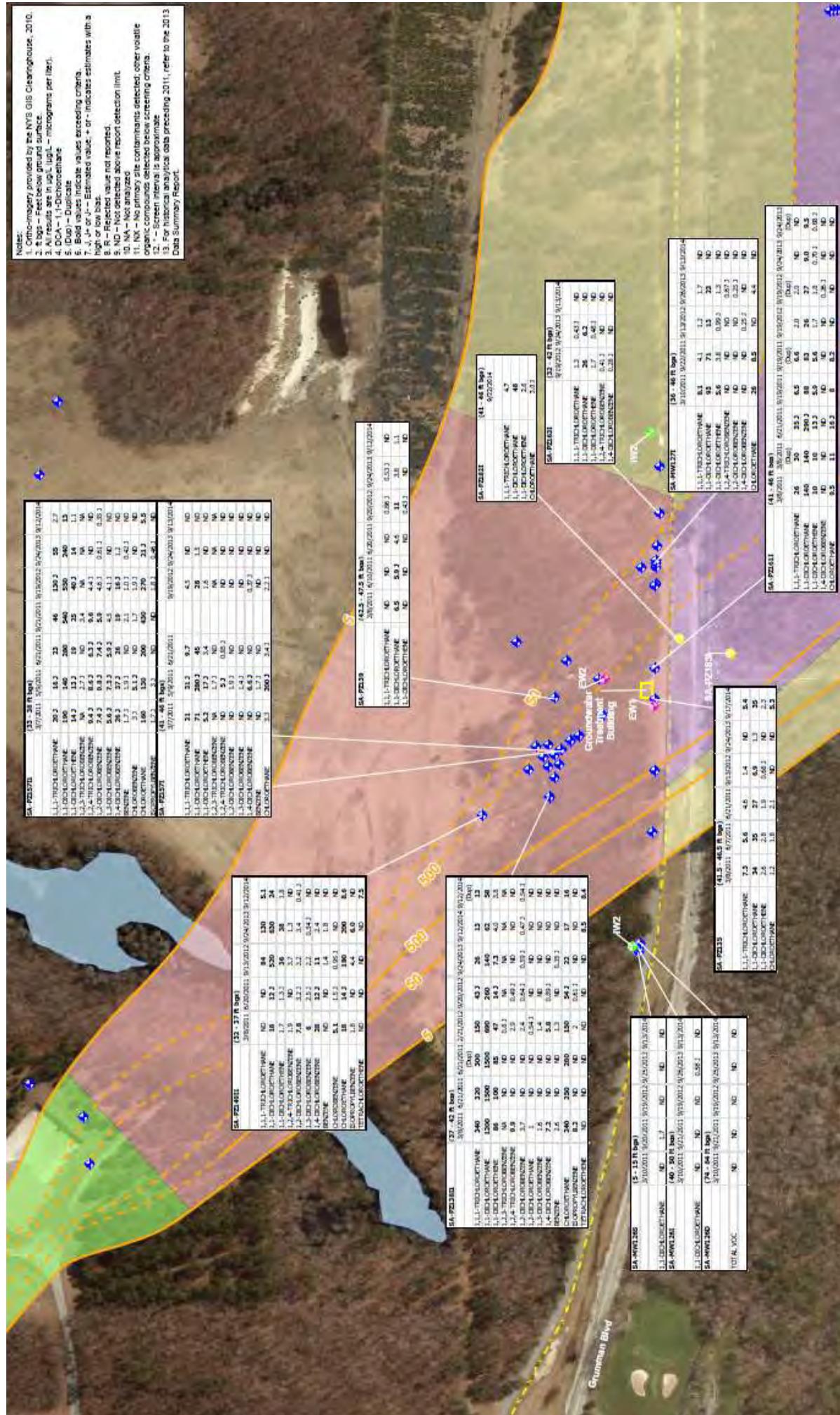
# Groundwater Flow (September 2014)



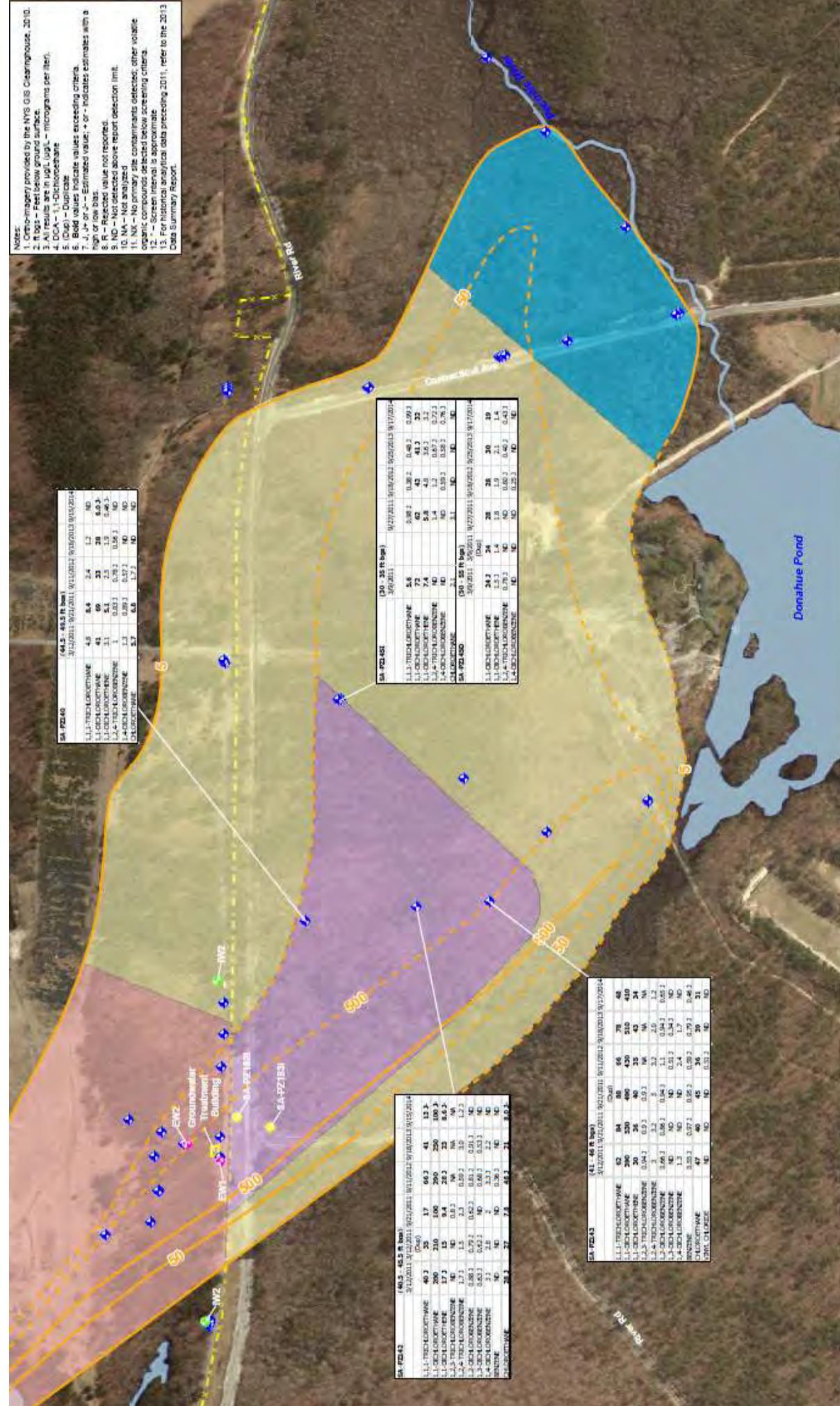
# Site 6A Source Area Results



# Fence Line Area Results



# Off-Site High Concentration Area Results





# Off-Site Low Concentration Area Results

# Pecconic River Area Results

Map showing the Pecconic River area results from NYS GIS Clearinghouse, 2010.

Notes:

1. Ortho-imagery provided by the NYS GIS Clearinghouse, 2010.
2. If no value is present below ground surface.
3. All results are in µg/L – micrograms per liter.
4. DCA – 1,1-Dichloroethane
5. Dibut – Dibutylate
6. Bold values indicate values exceeding criteria.
7. “-” or “\*” indicates estimates with a range or no data.
8. ND = detected value not reported.
9. No – not analyzed above report detection limit.
10. NA – Not applicable.
11. NC – Non-detectable, one or more organic compounds detected below screening criteria.
- 12 – Screen Interval is Specified.
- 13 – Screen Interval is Specified.

Data Summary Report



# Summary – 2014 Results



## • Groundwater, Site 2 (Fire Training Area)

- Site 2 On-property
  - 17 VOCs detected across 7 of 14 locations
  - MCL exceedances only at FT-MW03S
  - TCA and DCA
  - VOCs above  $\frac{1}{2}$  MCL at FT-MW02S
  - 1,2-dichlorobenzene & ethylbenzene
  - All other locations less than 1 µg/L total VOCs
- Site 2 Off-property
  - 9 VOCs detected across 6 of 7 locations
  - 4 MCL exceedances (TCE, DCE, DCA and PCE) at FT-PZ460I “anomaly”
  - TCE MCL also exceeded nearby at FT-PZ461I and FT-PZ458I
  - Data in this area consistent with prior results; anomaly decreasing
- Abandonment of 1 on-property and 3 off-property piezometers with no recent VOC detections or limited detections of VOCs not considered site chemicals of concern should be considered

# Summary (cont'd)

## • Groundwater, Site 6A/10B

– Sites 6A (Fuel Calibration Area) /10B (Engine Test House)

- 18 VOCs detected across 5 of 12 locations; MCLs exceeded at 3 locations
- 5 MCLs (CA, DCA, ethylbenzene, isopropyl benzene and DCE) exceeded at FC-MW03SR1
- Ethylbenzene and isopropyl benzene MCLs exceeded at FC-MW02SR1
- PCE MCL exceeded at FC-PZ05I1
- Estimated VOC mass flux across FC-MW05/09/10 cluster is 0.2 lbs/yr, below benchmark to consider additional Source Area treatment
  - Except for increase at FC-MW03SR1, results are consistent with recent years; continue monitoring of Source Area
  - RD recommendation for abandonment of 8 wells not currently sampled should be considered for implementation



# Summary (cont'd)



## • Groundwater, Southern Area

### -Fence Line Area

- 11 VOCs detected across 9 of 12 locations; MCLs exceeded at 5 locations
- CA, DCA, PCE and TCA MCLs exceeded at SA-PZ138I1 and SA-PZ149I1
- DCA, TCA, and CA exceeded MCLs at SA-PZ135 and SA-PZ157I1

### -Offsite High Concentration Area

- 8 VOCs detected across 5 of 5 locations; MCLs exceeded at 5 locations
- Highest concentrations near center of plume; 4 MCLs exceeded at 2 locations, and DCA exceeded MCL at all 5 locations
- Results indicate decreasing VOC concentrations in this area; more pronounced decline along the eastern edge of the High Concentration Area

### -Offsite Low Concentration Area

- 19 VOCs detected across 13 of 18 locations
- MCL exceedances mostly towards southern and western edges of the plume
- MCLs exceeded at 8 locations; DCA exceeded MCL at all 8 of these locations

-RD recommendation for abandonment of wells and piezometers not currently sampled should be considered for implementation

# Summary (cont'd)



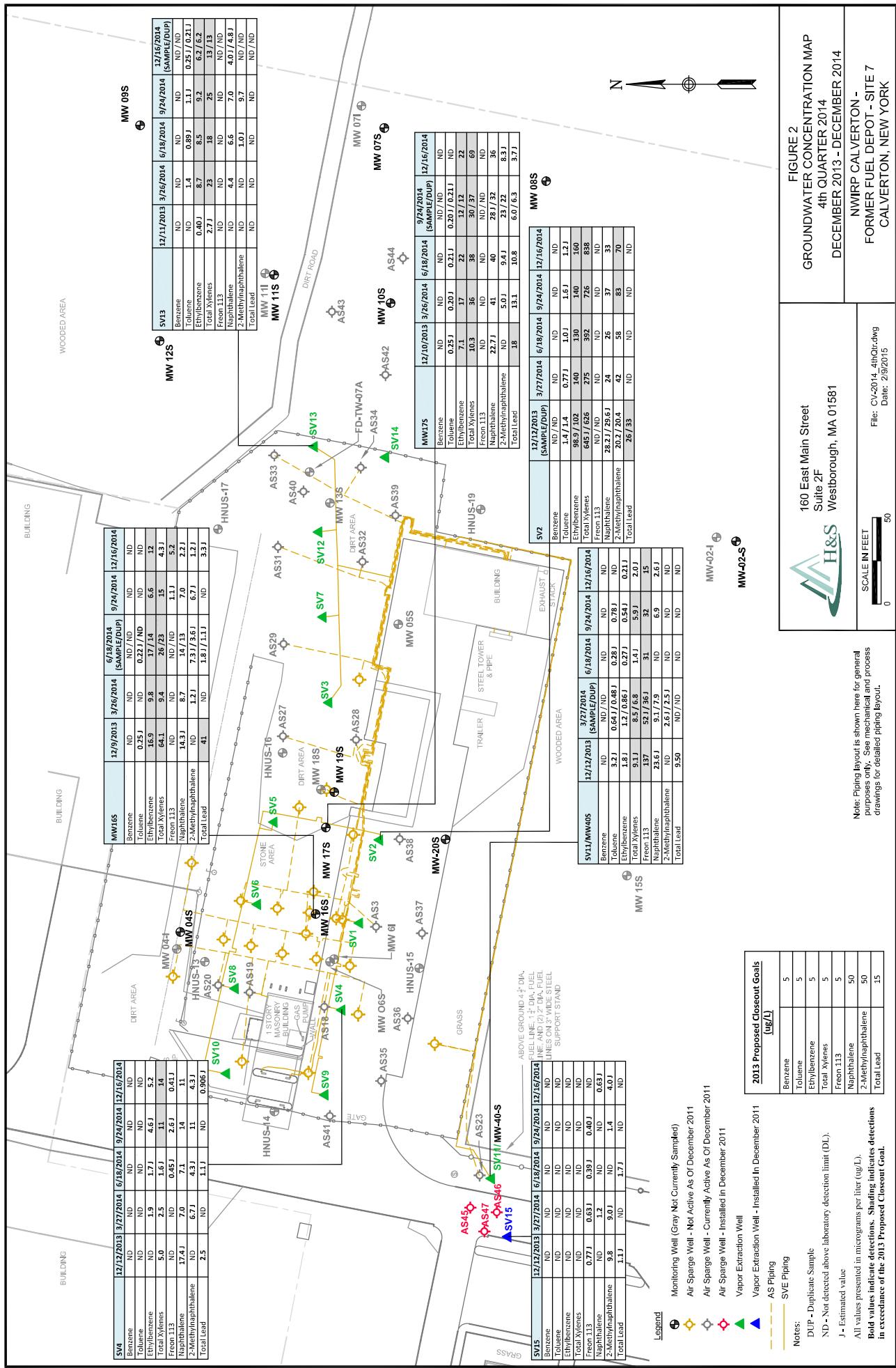
## • Peconic River Area

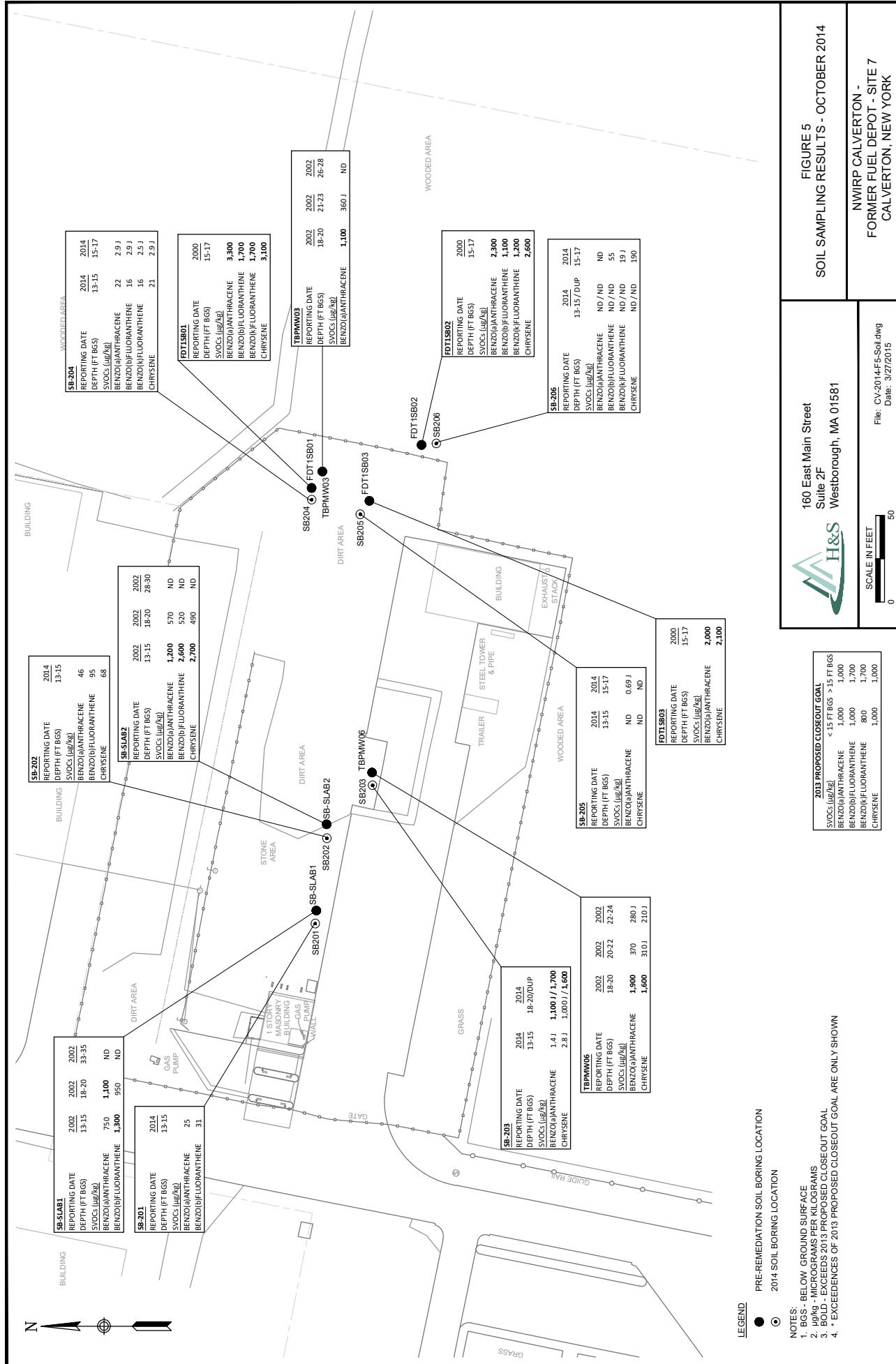
### -Groundwater

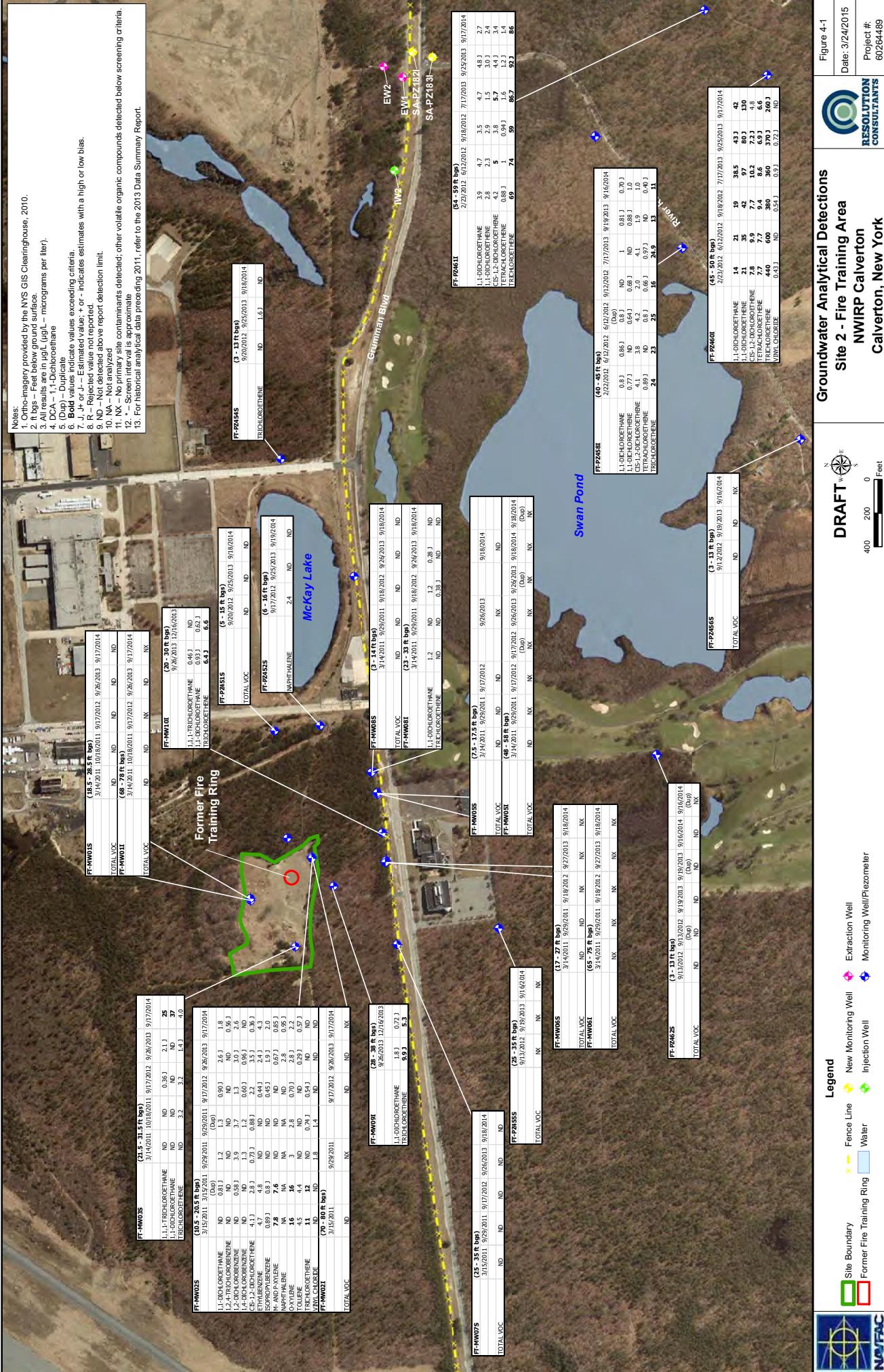
- 8 VOCs detected across 5 of 7 locations
  - DCA exceeded MCL at SA-PZ118S and porewater benchmark at SA-PZ124 and SA-PZ147
- Sediment
  - 10 VOCs detected in 2014, but 4 are either lab contaminants (e.g., acetone) are or naturally-occurring (carbon disulfide)
  - Multiple VOCs detected at SA-SD124, methyl acetate in SA-SD125 in September, and no detections at SA-SD201 or SA-SD204
  - The RD did not adopt benchmarks for sediment; RD recommendation to discontinue sediment sampling should be considered for implementation
- Surface Water
  - 3 VOCs detected across all 4 locations, but acetone is a lab contaminant
  - DCA observed at SA-SW124 in May and September, and SA-SW204 in September
  - DCE at SA-SW124 in September only
  - All detections were below RD benchmarks



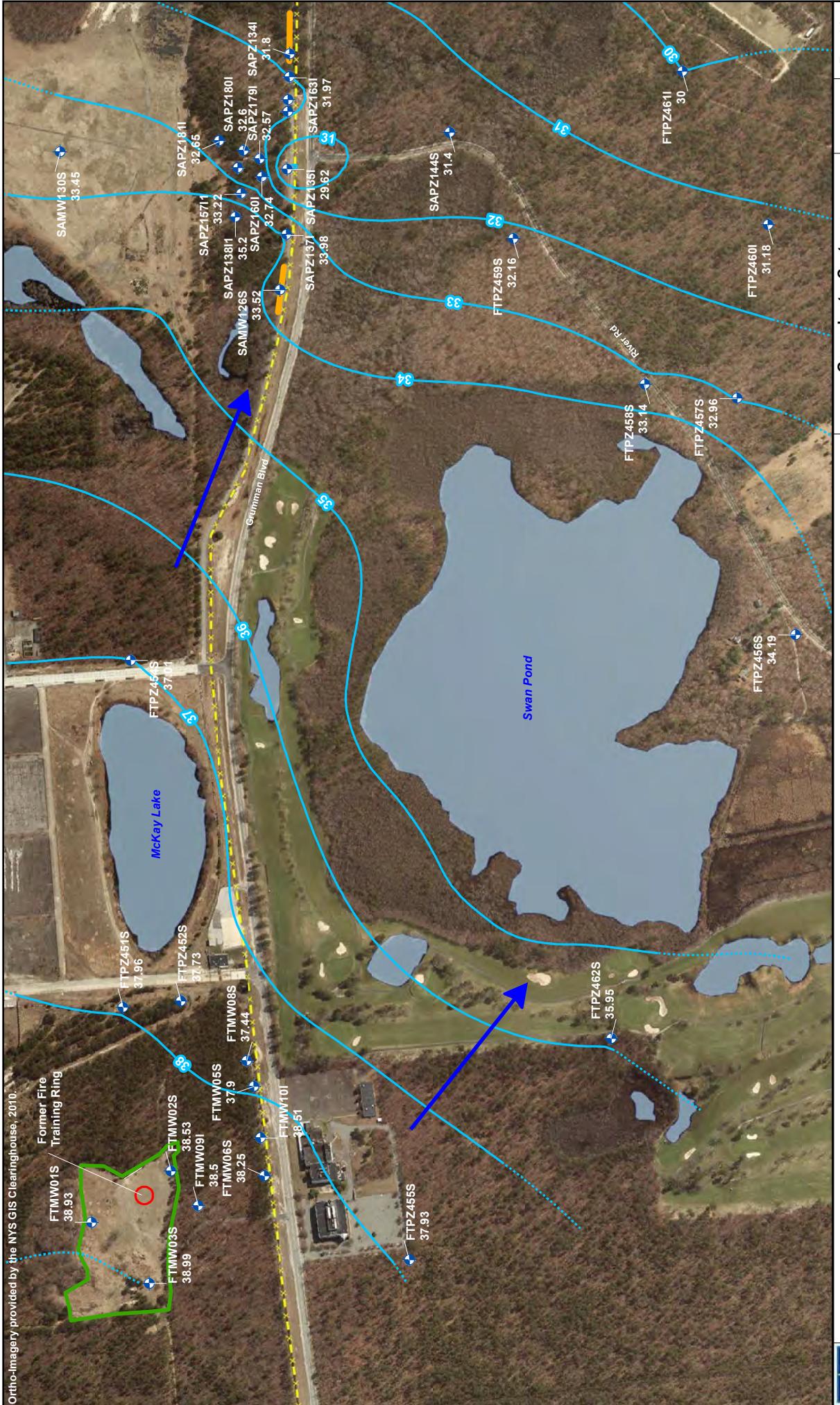
Questions?







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



Legend

Former Fire Training Ring  
Water  
Fence Line  
Infiltration Gallery

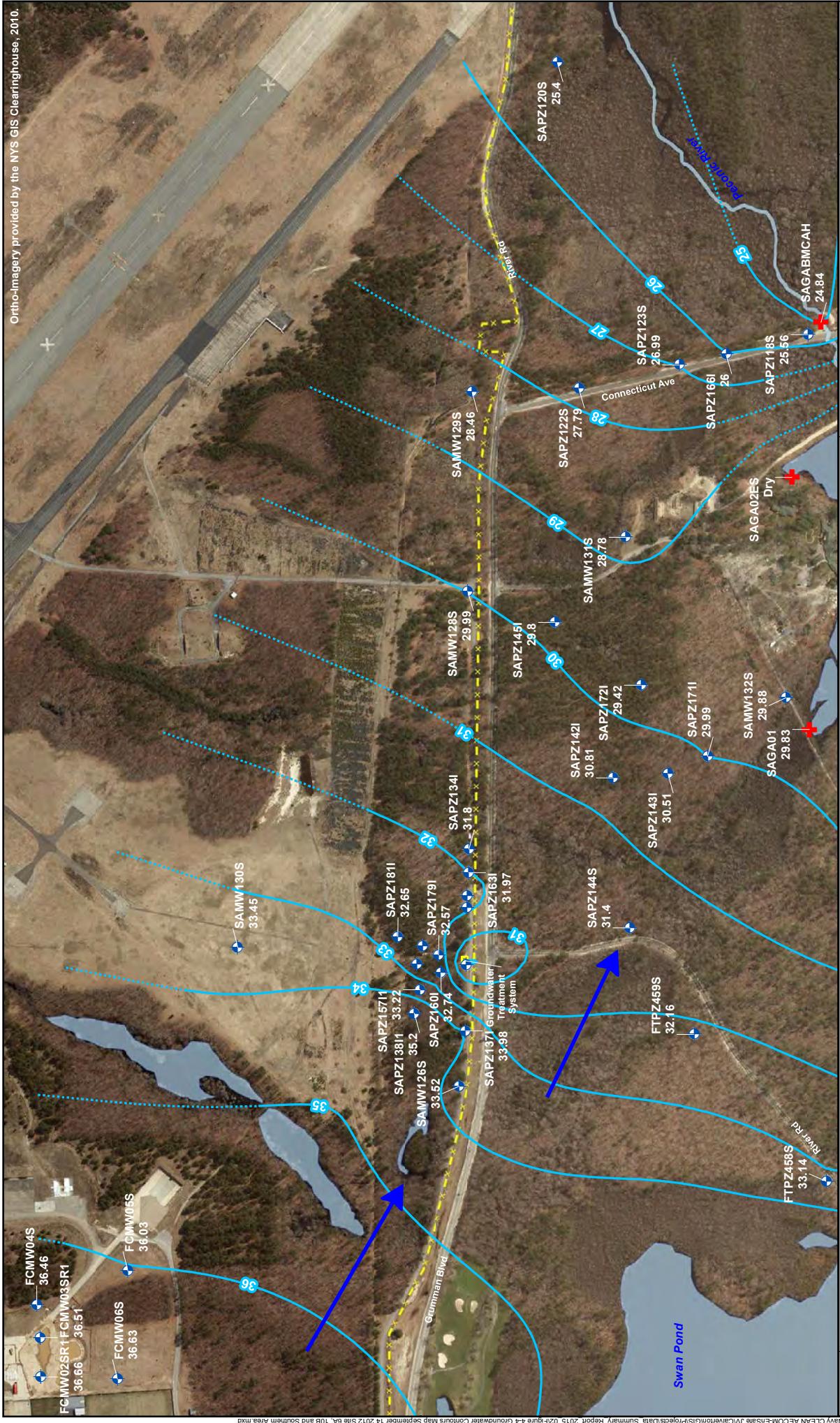
DRAFT  
0 200 Feet

Groundwater Contours  
September 2014  
Site 2 - Fire Training Area  
NWIRP Calverton  
Calverton, New York

Figure 4-2  
Date: 3/24/2015  
Project #:  
60264489



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



Project #	Date: 3/24/2015	Figure 4-4
60264489	RESOLUTION CONSULTANTS	Site 6A and Southern Area NWIRP Calverton Calverton, New York



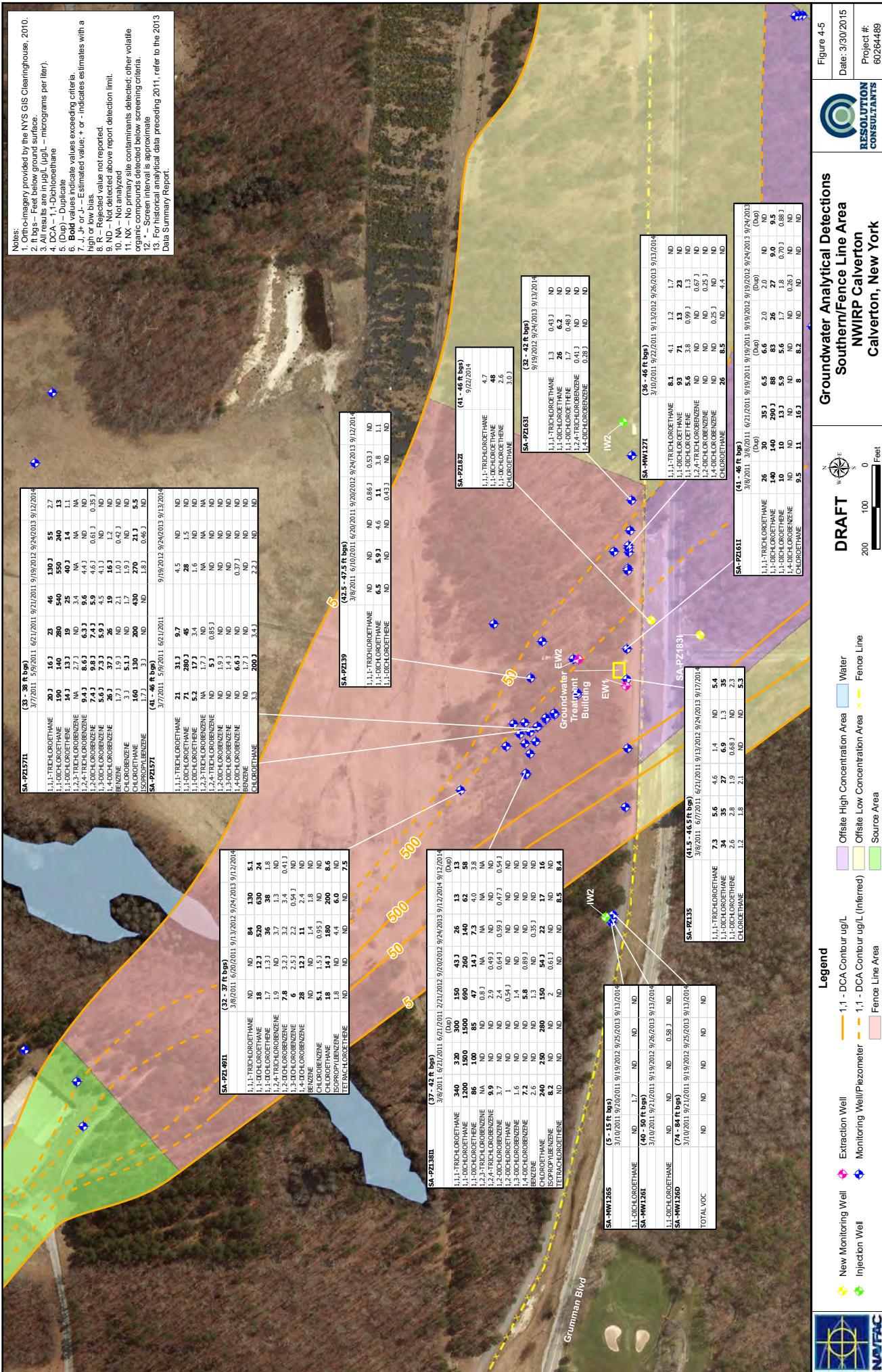


Figure 4-5

Date: 3/30/2015

Project #:

60264489



### Groundwater Analytical Detections Southern/Fence Line Area

NWIRP Calverton  
Calverton, New York

#### Legend

- New Monitoring Well
- Extraction Well
- Injection Well
- Offsite High Concentration Area
- Offsite Low Concentration Area
- Fence Line
- Source Line Area



Page 10 of 10

Notes:

- Ortho-imagery provided by the NYS GIS Clearinghouse, 2010.
- It's - Feet below ground surface.
- All results are in  $\mu\text{g/L}$  ( $\text{ug/L}$  - micrograms per liter).
- DCA - 1-Dichloroethane
- Dup - Duplicate
- Bold values indicate values exceeding criteria.
- J,J+ or J- - Estimated value + or - indicates estimates with a high or low bias.
- R - Report value not reported.
- ND - Not analyzed above report detection limit.
- NA - Not analyzed
- NX - No primary site contaminants detected; other volatile organic compounds detected below screening criteria.
- Scree interval is approximate
- For historical analytical data preceding 2011, refer to the 2013 Data Summary Report.

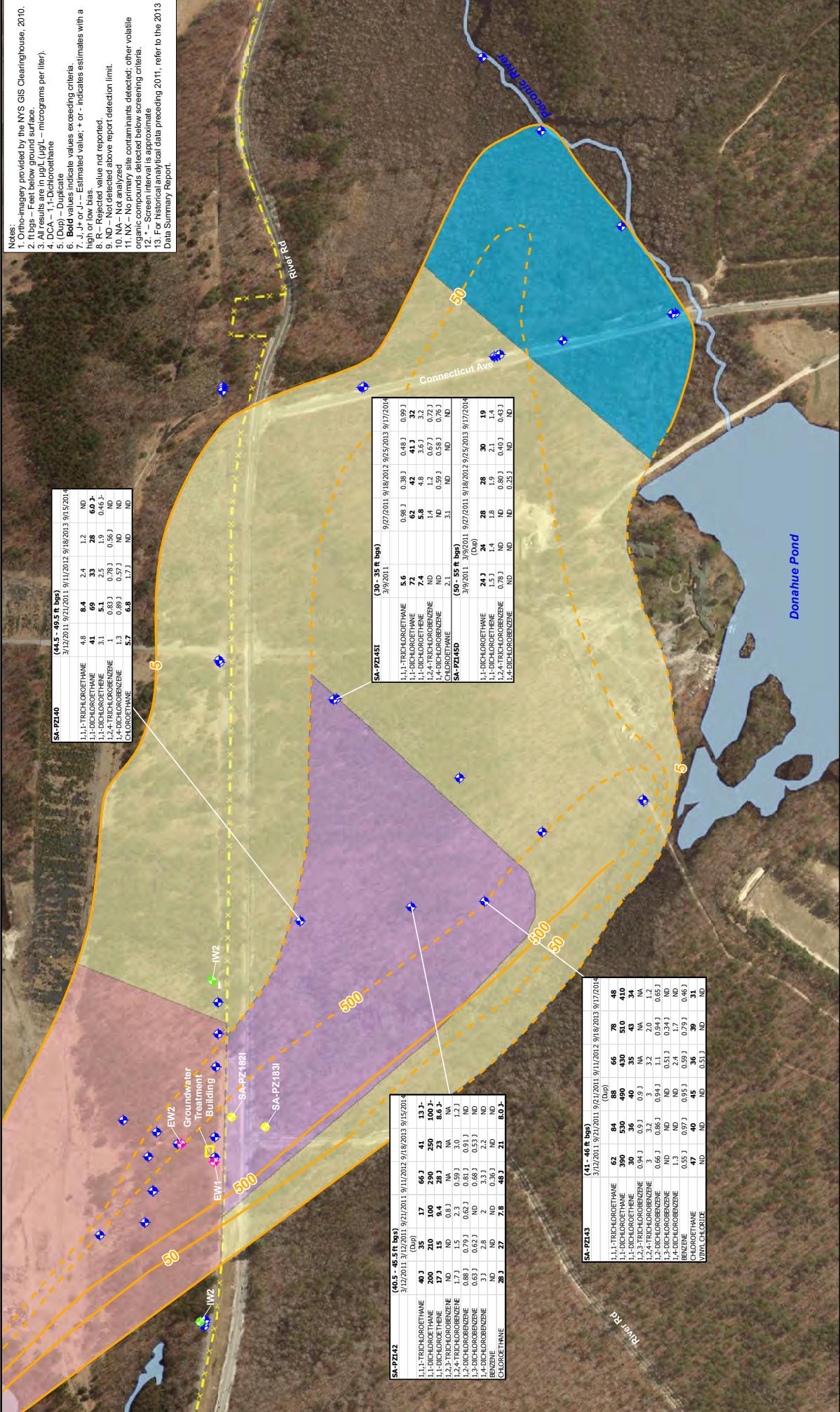


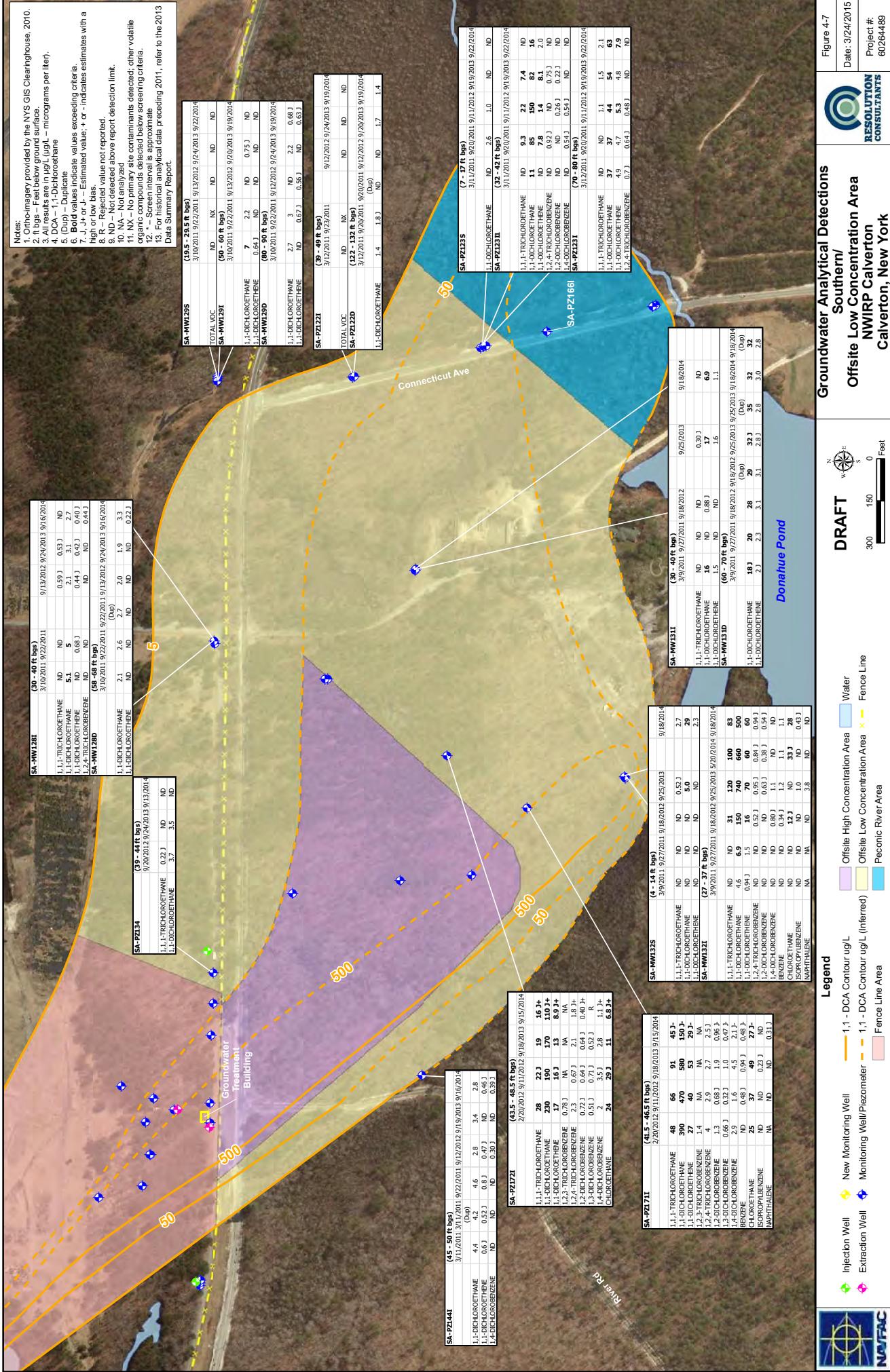
Figure 4-6  
Date: 3/24/2015  
Project #: 6026489

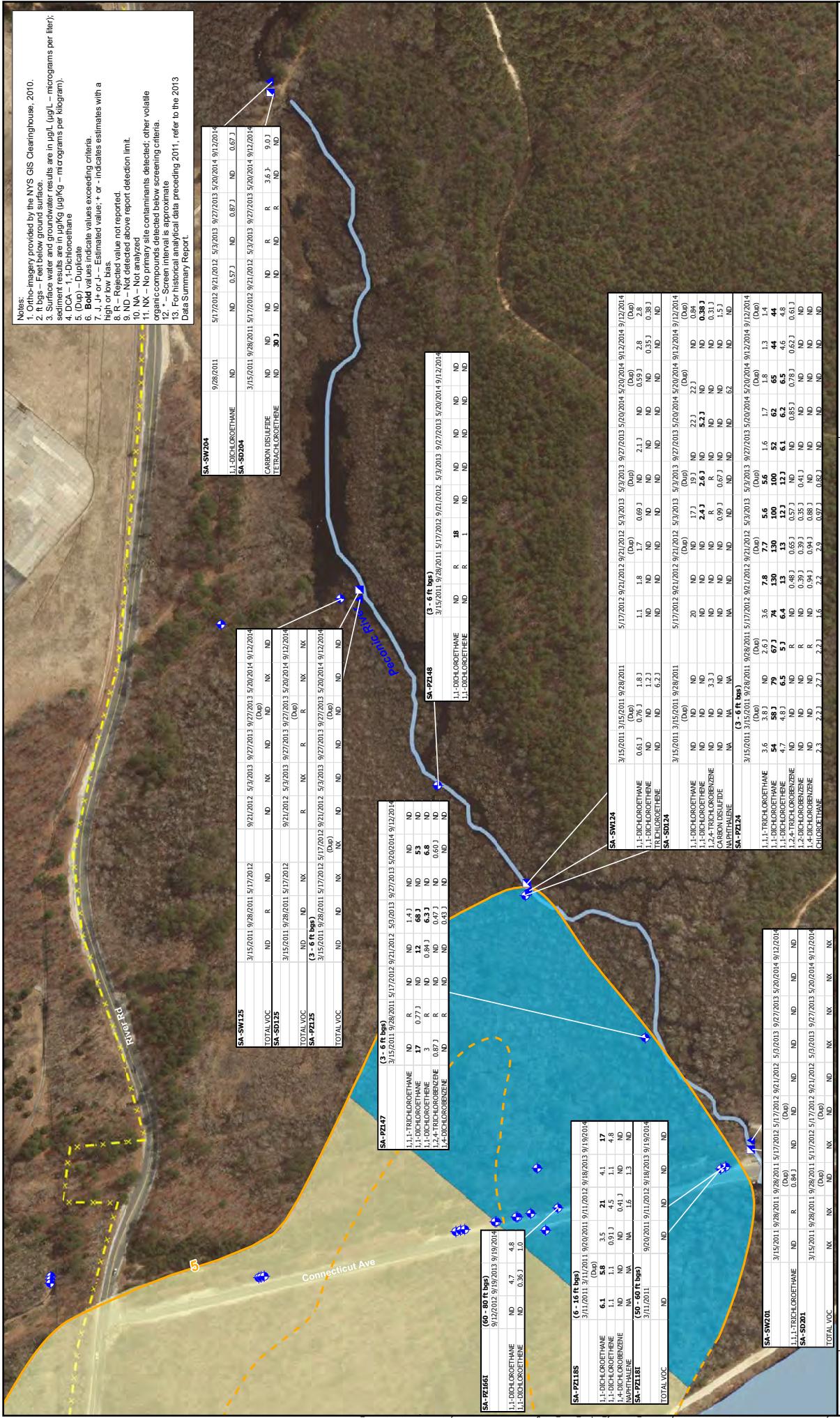
Groundwater Analytical Detections  
Offsite High Concentration Area  
NWIRP Calverton  
Calverton, New York

DRAFT  
N E S W  
0 150 Feet

Legend  
Offsite High Concentration Area  
Offsite Low Concentration Area  
Fence Line  
Peconic River Area







**Analytical Detections  
Southern/Peconic River Area  
NWIRP Calverton  
Calverton, New York**

A compass rose indicating North, South, East, and West directions. Below it is a scale bar with markings for 0, 100, and 200.

Offsite Low Concentration Area — Fence Line  
Peconic River Area

## Legend

Figure 4-8  
Date: 3/30/2015  
Project #: 60264490

## 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, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
8. R – Rejected value not reported.
9. ND – Not detected above report detection limit.
10. NA – Not analyzed
11. NX – Not primary site contaminants detected; other volatile organic compounds detected below screening criteria.
12. \* – Screen interval is approximate
13. For historical analytical data preceding 2011, refer to the 2011 Data Summary Report.

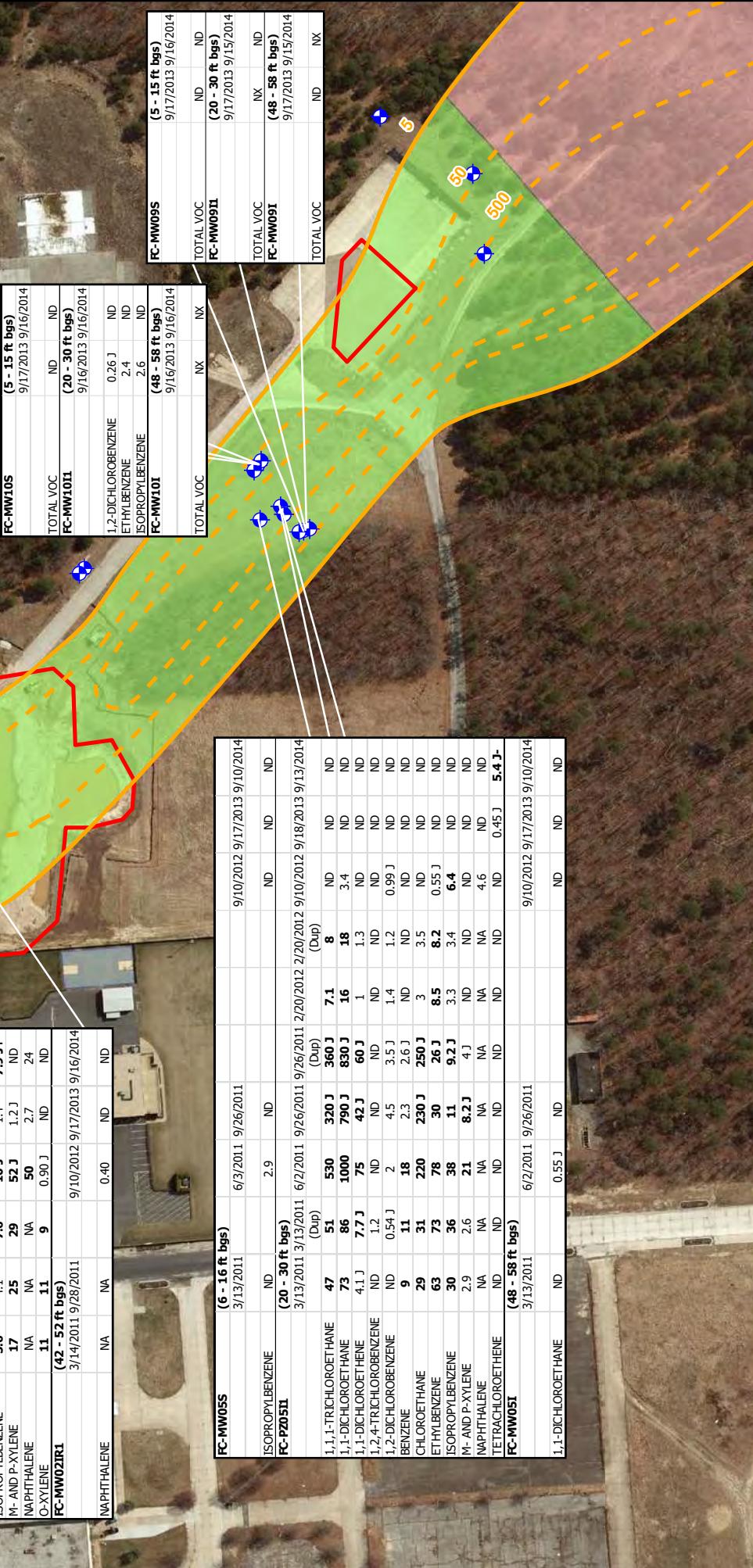


**(3 - 13\* ft bgs)**

	3/14/2011	9/28/2011	2/20/2012	9/17/2013	9/15/2014
<b>FC-MW05S</b>	ND	ND	ND	ND	ND
ISOPROPYLBENZENE	ND	ND	ND	ND	ND
<b>(6 - 16 ft bgs)</b>					
<b>FC-PZ05II</b>	ND	ND	ND	ND	ND
ISOPROPYLBENZENE	ND	ND	ND	ND	ND

**(20 - 30 ft bgs)**

	3/13/2011	3/13/2011	6/2/2011	9/26/2011	9/13/2014
<b>FC-PZ05II</b>	(Dup)	<b>51</b>	<b>530</b>	<b>320 J</b>	<b>7.1</b>
1,1,1-TRICHLOROETHANE	<b>47</b>	<b>73</b>	<b>86</b>	<b>790 J</b>	<b>16</b>
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE	41 J	<b>7.7 J</b>	<b>75</b>	<b>42 J</b>	ND
1,2,4-TRICHLOROBENZENE	ND	1.2	ND	ND	1.3
1,2-DICHLOROBENZENE	ND	0.54 J	2	4.5	3.5 J
BENZENE	<b>9</b>	<b>11</b>	<b>18</b>	<b>2.3</b>	2.6 J
CHLOROETHANE	<b>29</b>	<b>31</b>	<b>220</b>	<b>230 J</b>	<b>250 J</b>
ETHYL BENZENE	<b>63</b>	<b>73</b>	<b>78</b>	<b>30</b>	<b>26 J</b>
ISOPROPYLBENZENE	<b>30</b>	<b>36</b>	<b>38</b>	<b>11</b>	<b>9.2 J</b>
M- AND P-XYLENE	2.9	2.6	<b>21</b>	<b>8.2 J</b>	4 J
NAPHTHALENE	NA	NA	NA	NA	NA
<b>FC-MW05I</b>	<b>(48 - 58 ft bgs)</b>				
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND



**Groundwater Analytical Detections  
Site 6A - Fuel Calibration Area  
NWIRP Calverton  
Calverton, New York**

**DRAFT**

**Legend**

- 1,1 - DCA Contour ug/L
- - 1,1 - DCA Contour ug/L (Inferred)
- Excavation Area 2009/2010
- Fence Line Area
- Source Area



**Figure 4-3**

Date: 3/24/2015  
Project #: 60264489