RESTORATION ADVISORY BOARD MEETING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), BETHPAGE
TOWN OF OYSTER BAY ICE SKATING RINK COMMUNITY ROOM
1001 STEWART AVENUE, BETHPAGE, NEW YORK
WEDNESDAY, MAY 15, 2013

The Thirty-first (31st) meeting of the Restoration Advisory Board (RAB) was held at the Bethpage Community Park Ice Skating Rink Community Room in Bethpage, New York. Meeting attendees included representatives from the Navy (Lora Fly), New York State Department of Environmental Conservation (NYSDEC) (Steven Scharf), New York State Department of Health (NYSDOH) (Steve Karpinski), United States Environmental Protection Agency (USEPA) (Peter Mannino), Town of Oyster Bay (John Ellsworth), RAB Community Members (Charles Bevilacqua), Tetra Tech (David Brayack), H&S Environmental (Greg Birch, Jen Good, John Hudacek, and Al Taormina), ARCADIS (Paul Martarano), Bethpage Water District (Michael Boufis), H2M (Richard Humann-BWD and Paul Grainger-MWD), Massapequa Water District (John Caruso), Steel Equities/Edgewater Environmental (Stephen Hix and Kevin Lumpe), and Resolution Consultants (Brian Caldwell, Eleanor Vivaudou and Michael Zobel). There were several guests at the meeting, including two Bethpage residents and two residents from neighboring towns. The meeting sign-in sheet is provided as Attachment 1.

WELCOME AND AGENDA REVIEW

The Navy representative, Ms. Lora Fly, welcomed everyone to the RAB meeting and introduced the meeting agenda. The agenda for the meeting is included as Attachment 2. The Navy presentations for the meeting are included in Attachment 3. Ms. Fly informed the attendees on how to navigate to the public website for NWIRP Bethpage.

COMMUNITY UPDATE AND REVIEW AND APPROVAL OF MEETING MINUTES

Ms. Fly asked if there was a quorum of RAB members so that the December 2012 minutes could be approved. Approval of the meeting minutes was tabled until the next RAB meeting because a quorum of RAB members was not present.

TECHNICAL PROGRESS - GM-38 AREA OPERATION AND SOIL VAPOR EXTRACTION CONTAINMENT SYSTEM PERFORMANCE AND MODIFICATIONS

Ms. Jen Good provided a presentation on the status of the GM-38 groundwater treatment plant (GWTP) operations, and the Site 1 soil vapor extraction (SVE) containment system operation. The presentation is included in Attachment 3.

The GM-38 GWTP is being operated to remove volatile organic compounds (VOCs) from groundwater. Operation of the system began in October 2009 and will continue for approximately 5 years (until 2014). The primary treatment process is air stripping followed by carbon polishing. The extracted water is being treated to meet NYSDEC treatment standards before discharge into either an injection well or into a county recharge basin. Vapor from the air stripping process is being treated with carbon prior to venting to the atmosphere.

Ms. Good reviewed the results of VOC concentrations in groundwater extraction wells, which show a decreasing concentration trend. Recent activities include quarterly groundwater sampling in December 2012 and March 2013. The next scheduled quarterly sampling event is in June 2013.

To date, approximately 1,715 million gallons of water have been treated. Since the last RAB meeting, the system operated continuously, except for a shut down from December 13, 2012 through December 21, 2012 in order to replace and reconfigure a computer that had malfunctioned and to support a pumping test. The Navy will continue to monitor the performance of the system, including collection of monthly air and water compliance samples and quarterly groundwater samples.

A pumping test for the facility was conducted in late March 2013. This data is being used to perform a capture zone analysis for the system.

A question was posed as to how the Navy would define when the system could be shut down; Mr. Brayack answered that the Navy is developing an exit strategy for the facility that will in part use the capture zone analysis.

In answer to a question of why does it appear that a good deal of contamination may have bypassed the GM-38 area, Ms. Fly answered that GM-38 was installed to address a well defined hot spot in this area that ranged in depth from 250 to 500 feet below ground surface. The treatment system was designed to capture and treat groundwater in that area with VOC concentrations greater than 1 ppm until groundwater quality matched the surrounding area. The referenced contamination that may have bypassed the recovery system is much shallower and lower in concentration and or at a much greater depth (600-800 feet below ground surface). Groundwater at these other depths was not intended to be captured by the system.

In answer to a question of whether GM-38 will be running in conjunction with OU3, Ms. Fly stated that this will be discussed at the December RAB meeting.

Ms. Good then reviewed the status of the Site 1 SVE Containment System, and indicated that the purpose of the system is to prevent off site migration of Site 1 VOC-impacted soil gas and to clean up off site soil gas. Operation of the system began in January 2010 and is anticipated to continue until 2015. Ms. Good indicated that optimization activities are ongoing to improve performance, evaluate the capture zone, and reduce operating costs. Based on the evaluation of the system operation, five additional SVE wells were installed in October 2011 and brought on-line in November 2011. Ms. Good indicated that the system has been performing well. The Navy will continue to operate the system and collect the necessary monthly air compliance samples and quarterly air samples. The next quarterly event is scheduled for May 2013. Ms. Good stated that nine additional soil vapor pressure monitor (SVPM) points were installed in September 2012.

TECHNICAL PROGRESS – SITE 1 ACTIVITIES

Mr. Brayack (Tetra Tech) presented the status of the Site 1 soil and groundwater investigation that focused on polychlorinated biphenyls (PCBs) and chromium. In addition, the status of the AOC 32 tanks was discussed. The presentation is included in Attachment 3.

The Site 1 field investigation continued this period, with the final samples to be collected in June 2013. Since 2010, the investigations have included the collected of soil samples to 75 feet below ground surface and water samples to depths of 296 feet below ground surface. The results of these investigations will be provided in an FS/RI addendum planned for late fall 2013.

Mr. Brayack provided an update on the two underground storage tanks (USTs) identified in 2012. These tanks were removed in September 2012 and the contents were collected and disposed off site. Soil sampling underneath the tanks did not find evidence of a release.

Other questions asked and answered were:

- Why are tanks still being found on the facility (in reference to the AOC 32 tanks discovered near Site 1)? This was answered that historically underground storage tanks are sometimes abandoned in place, and therefore their shell remains onsite intact but filled with inert material.
- Are there other tanks present at the facility? This was answered that most known tanks were closed out and replaced by above ground storage tanks (ASTs).

A resident mentioned the use of radiological material at the facility and expressed the opinion that that the emergency planning and community right to know act is not being adhered to. Ms. Fly indicated that a neutron generator was identified in construction drawings, but was closed in the early 1960s. Also, Northrop Grumman is still looking at their records. Ms Fly also stated that EPRA regulates radioactive

activity work in a facility. The Navy decommissioned all buildings that went to Nassau County. Mr. Scharf stated that a Finding of Suitability to Transfer (FOST) was performed and that Northrop Grumman had to decommission all building prior to turning the property over to Nassau County.

TECHNICAL PROGRESS – OPERABLE UNIT (OU) 2 GM-38 TREATMENT SYSTEM AND OFFSITE GROUNDWATER INVESTIGATION

Mr. Brayack discussed the GM-38 capture zone analysis and other offsite groundwater evaluations. Since the GM-38 system has been in operation for over three years, it is now being evaluated to see if the design goals have been met. Also, the Navy is conducting a groundwater evaluation throughout the area and that USGS is working in conjunction with the Navy to evaluate the data.

GM-38 Capture zone analysis The GM-38 system started operation in 2009, with one well. In 2010 the second well started running. The design capture zone for this system is a 100-acre area, 250 to 500 feet below ground surface where over 1 parts per million (ppm) of TCE was located (a hotspot as defined in the ROD). The USGS is currently working on a groundwater model of the area. Testing in the GM-38 Area was conducted in March and April 2013. In addition, the Navy is evaluating groundwater effects through these areas. The area-wide testing started in December 2012 and will go through December 2013.

It was noted that the Bethpage water district has been very cooperative in providing pumping logs that were recorded in 1 to 5 minute intervals. So far, over 100,000 data/time points have been collected and are being used by USGS to calibrate the groundwater model.

There were questions as to why the offsite groundwater contamination is not being treated as one plume, and that the current remedies do not appear to address the full issue. Ms Fly stated that there are actually two separate plumes (OU2 and OU3), and baseline remedial strategies for these two plumes have been developed and approved by NYSDEC. In addition to the Navy and Northrup Grumman, there are numerous smaller contributors to the overall offsite groundwater contamination. Because of the size of the offsite plumes, treatment as one immense plume without specific target remediation (such as GM-38) would be ineffective.

In answer to the question, who is in charge of offsite groundwater remediation, Ms Fly replied that the Navy is conducting activities associated with releases on its property as identified in the OU2 ROD and that NYSDEC provides oversight. Northrop Grumman shares responsibilities and performs activities associated with OU2.

In answer to the question, why is the NYSDEC accepting that the contamination can flow out to the ocean? Mr. Scharf replied that because the area was too large to contain, a network of wells was installed to monitor groundwater quality and a wellhead treatment program has been put in place where needed. He pointed out that there is a low MCL (5 ppb), so a large area is impacted and that calculations indicate it would take 100 years to reach the ocean, but that the monitoring and remediation in place allows continual updates and targeted cleanup efforts to gage and address contaminant migration.

In answer to the question, at what depth is the Raritan clay found, Mr. Brayack responded that in the GM-38 Area, it is believed to be approximately 700 feet below ground surface. As a follow up question, it was asked whether contamination exists at depths greater than the GM-38 extraction wells. Mr. Brayack answered that the Navy is currently looking into it.

Mr. Caldwell continued with a discussion of the offsite groundwater investigations. The purpose of the OU2 groundwater investigation is to delineate the area of groundwater contamination south of NWIRP Bethpage. Contamination in this area is deep. The investigation includes the installation of vertical profile borings to quickly screen areas for the presence, depth, and concentration of contamination. Permanent monitoring wells are then installed to confirm the presence or absence of contamination and to develop contamination concentration trends. The vertical profile borings are approximately 12-inch diameter holes drilled into the ground. Drilling of each boring takes 4 to 6 weeks to complete. Samples of groundwater are collected during drilling at various depths and the borings extend to the Raritan Clay layer at a depth of up to 800 to 1,000 feet bgs. Approximately 36 groundwater samples per boring are collected and analyzed for VOCs. Mr. Caldwell reviewed figures showing NWIRP and Northrop Grumman properties, groundwater flow direction, and locations of completed wells and borings and planned wells and borings.

Mr. Caldwell spoke about the VPBs that are currently being installed. Drilling is currently underway at the site on Eiffel Place and the next site will be Lincoln Blvd.

Mr. Caruso indicated that the MCL for TCE has decreased in the past years from 10 ppm to 5 ppb and based on EPA advisories is on its way to zero. He stated it is a carcinogen and might be cumbersome to stop and treat 19 more wells. Ms Fly indicated that the Navy will comply with the value that the EPA sets as the MCL, which is currently 5 ppb. If the MCLs decrease then the Navy will look into technology to comply with these standards.

There was a discussion of what is being done to address the plume and are there any thoughts to containment. Ms Fly indicated that the OU2 ROD, which is in place, allows for alternative well head treatment to meet ROD objectives. It is presently agreed that because of mass and volume requiring treatment that the best approach is to have wellhead treatment on supply wells. The optimization report

had input from national experts in the field and the water districts, and that report confirmed that because the plume is so large, the alternative of complete containment is not feasible.

CLOSING REMARKS

Ms. Fly asked whether there were any other questions or comments. There were no other questions or comments. Ms. Fly indicated that the next RAB meeting would be held in November 2013. Ms. Fly thanked everyone for coming to the meeting and the meeting was adjourned.

ATTACHMENT 1

MAY 15, 2013 RAB MEETING SIGN-IN SHEET

31th RAB Meeting for NWIRP Bethpage
May 15, 2013
Sign-in List

Name (Print)	Address and/or email if interested in being on mailing list	Affiliation	How did you hear about the meeting?
John Ellsworth			
Ethan Irwin			
Michael Boufis			
Rich Humann			
Joanne Perico			
Joyce Marinaccio			
Hussalen John			
Kevin Lumpe			
Stephen Hix			
Dave Brayock			
Steven Scharf			

31th RAB Meeting for NWIRP Bethpage
May 15, 2013
Sign-in List

Name (Print)	Address and/or email if interested in being on mailing list	Affiliation	How did you hear about the meeting?
SANDRA D'ARCANGELO			
Mike Zobel			
Brian Caldwell			
Peter Mannino			
AL THOMAS			
JOHN CARUSO			
Paul Martorano			
Steve Lanfrucci			
CHARLES BEVILAC			
GREG BIRCH			
PAUL GRATHOFER			
Eleanor Vivanlov			

ATTACHMENT 2

MAY 15, 2013 RAB MEETING AGENDA

Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

Agenda for Restoration Advisory Board

Naval Weapons Industrial Reserve Plant Bethpage

Date: May 15, 2013

Time: 7:00 PM

Location: Community Room at the Ice Skating Center at Bethpage

- General overview – *Lora Fly, NAVFAC Mid Atlantic*
- Distribution of minutes – *All members*
- GM-38 Operations and Site 1 Soil Vapor Extraction Containment System Performance – *H & S*
- Onsite Activities-PCB area – *Tetra Tech*
- OU-2 Offsite Groundwater Investigation Installation of VPB and pump test activities performance– *Tetra Tech/Resolution Consultants*
- Closing remarks – *Lora Fly, NAVFAC Mid Atlantic*

RESOLUTION CONSULTANTS

ATTACHMENT 3

PRESENTATIONS

NAVFAC
Naval Facilities Engineering Command
NAVFAC MID-ATLANTIC

Restoration Advisory Board (RAB) Meeting

GM-38 Area Groundwater Treatment Plant and Site 1 Soil Vapor Extraction Containment System Operation

Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage

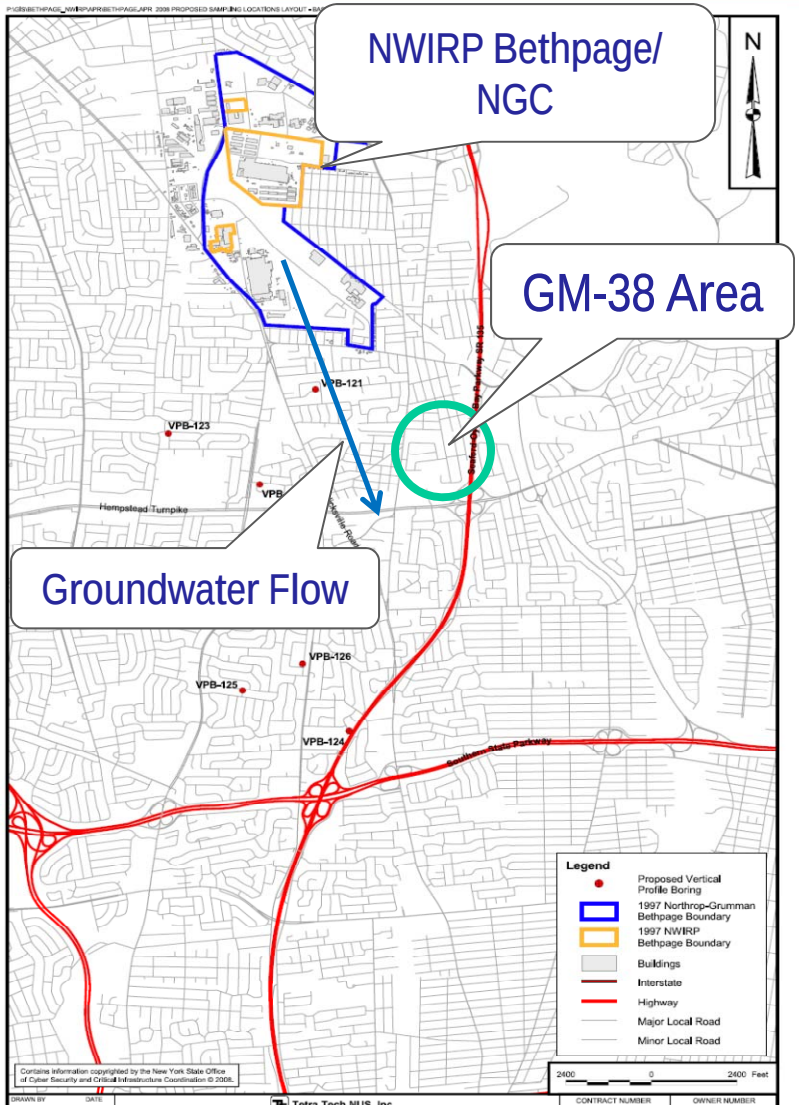
May 15, 2013

Presentation Agenda

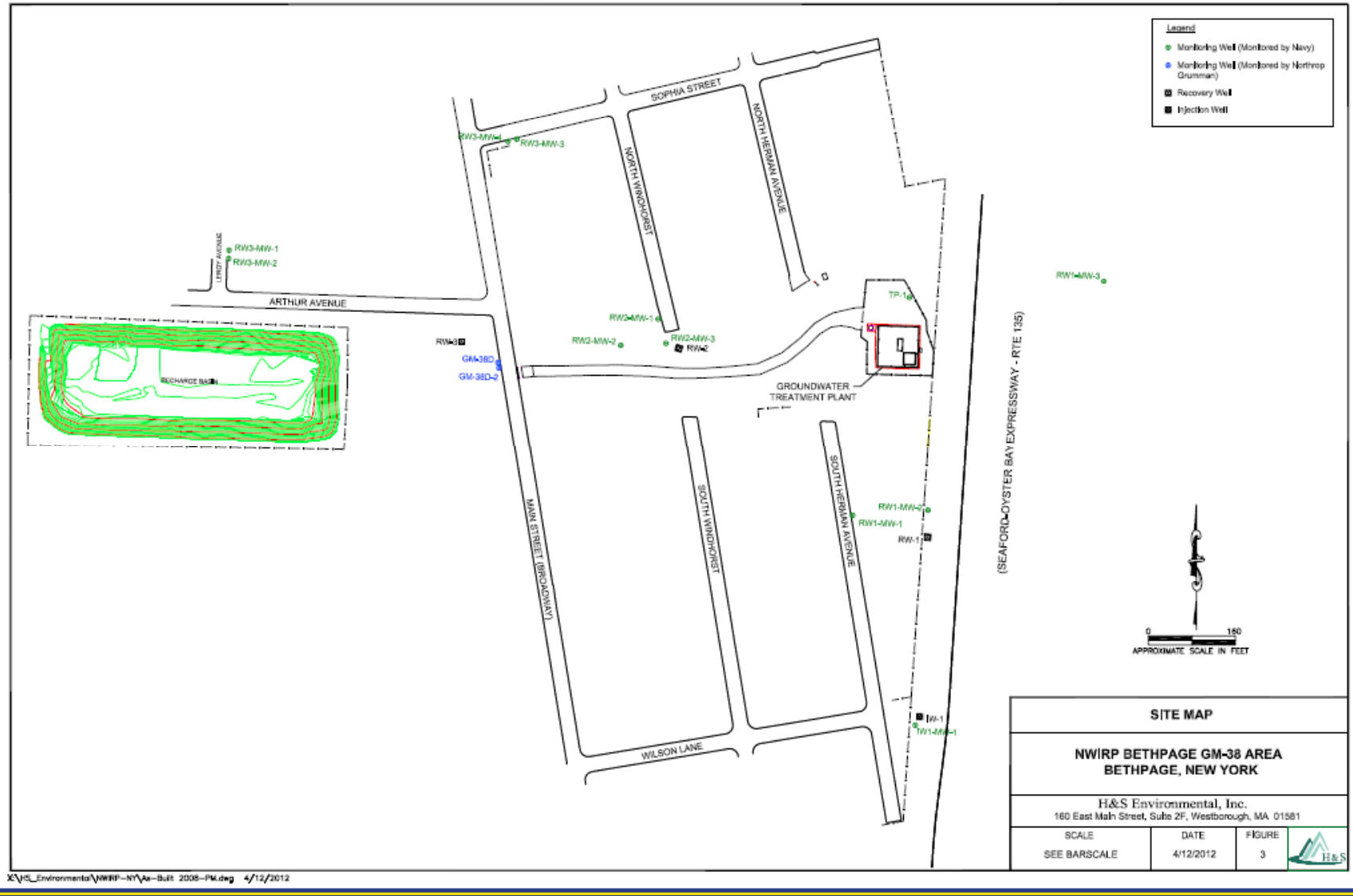
- GM-38 Groundwater Treatment Plant (GWTP)
  - Overview
  - Operational Activities
  - GWTP performance and future activities
- Site 1 SVECS (Soil Vapor Extraction Containment System)
  - Overview
  - Operational Activities
  - System performance and future activities

GM-38 Project Overview

- Purpose: Treat an area of higher concentration volatile organic compound (VOC)-impacted groundwater.
- System started operation in October 2009.
- In 2012, system extracted 40.3 million gallons of water and 128 pounds of VOCs per month.

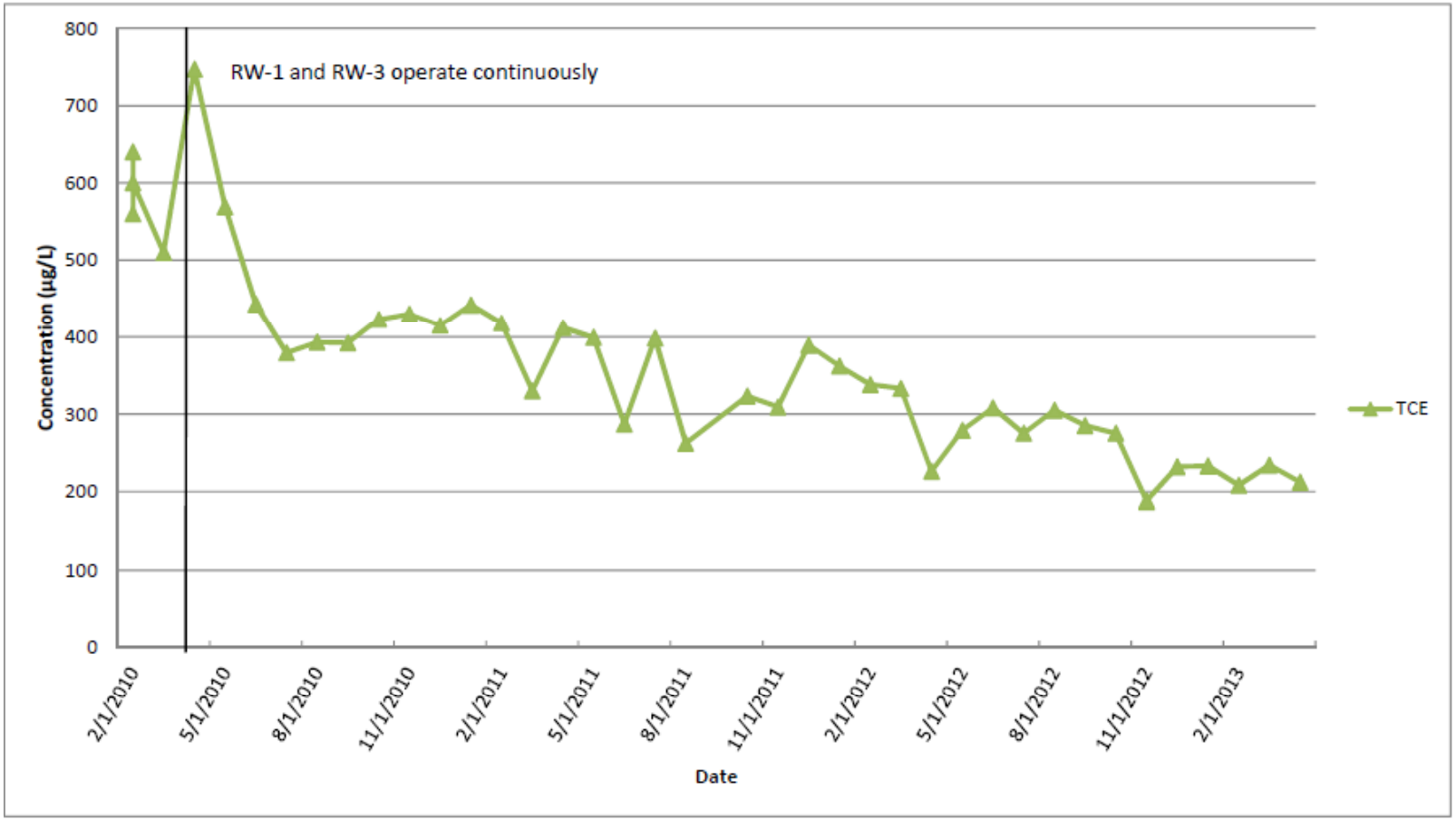


GM-38 REMEDIAL ACTION



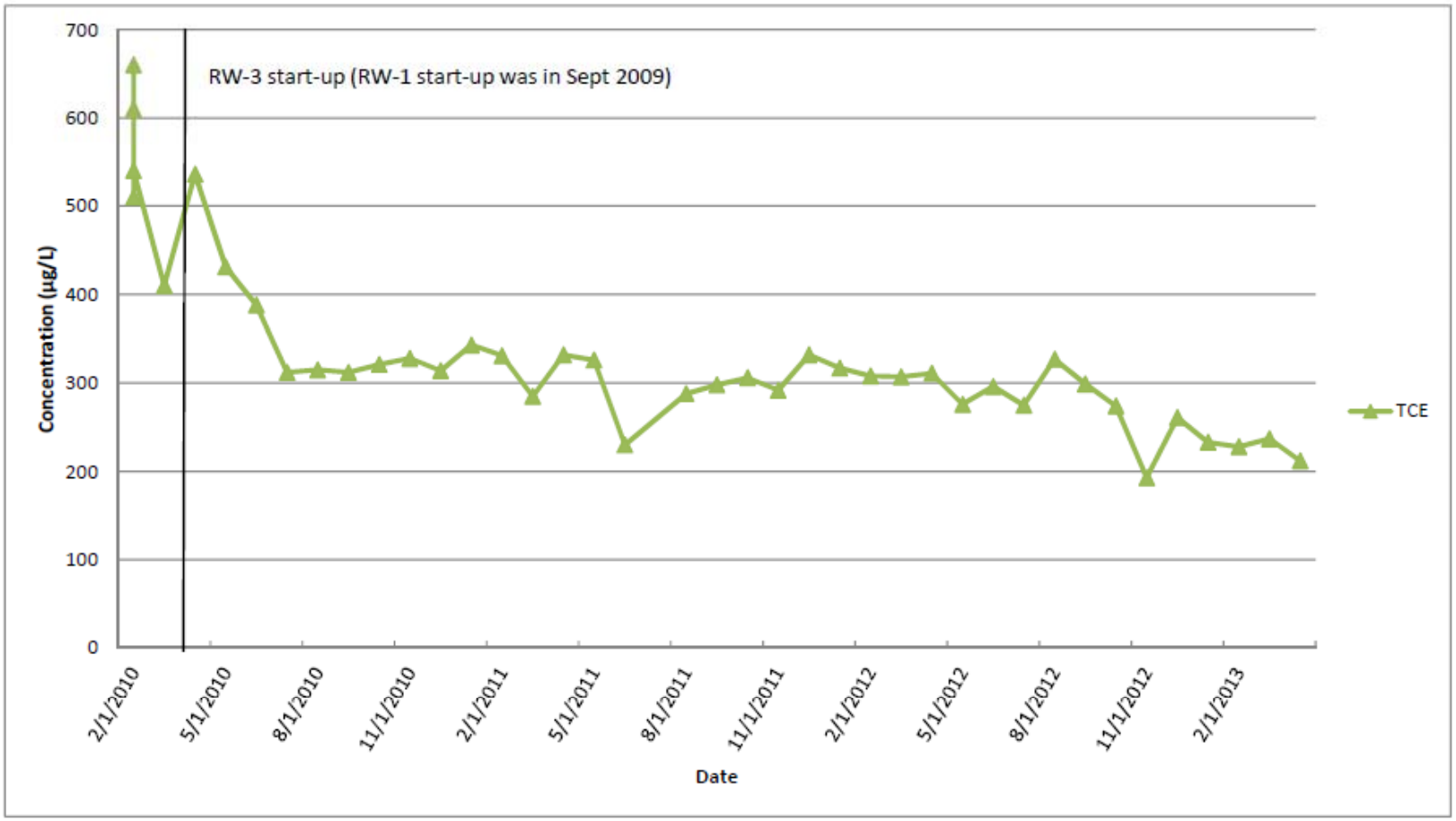
GM-38 REMEDIAL ACTION

Recovery Well RW-1 (335-395 and 410-435 ft bgs)
TCE Concentrations
GM-38 Groundwater Treatment Plant
NWIRP Bethpage, NY



GM-38 REMEDIAL ACTION

Recovery Well RW-3 (392-412 and 442-504 ft bgs)
TCE Concentrations
GM-38 Groundwater Treatment Plant
NWIRP Bethpage, NY



GM-38 GWTP Operational Activities

- Quarterly groundwater samples collected from eight monitoring wells (3-4 December 2012, 13-14 March 2013).
  - Next event scheduled for June 2013, to include several additional wells.
- System down 13-21 December 2012 for replacement and reconfiguration of new PC after current PC malfunctioned.
- Pump test performed 29 March 2013 – 15 April 2015.

GM-38 GWTP Performance and Future Activities

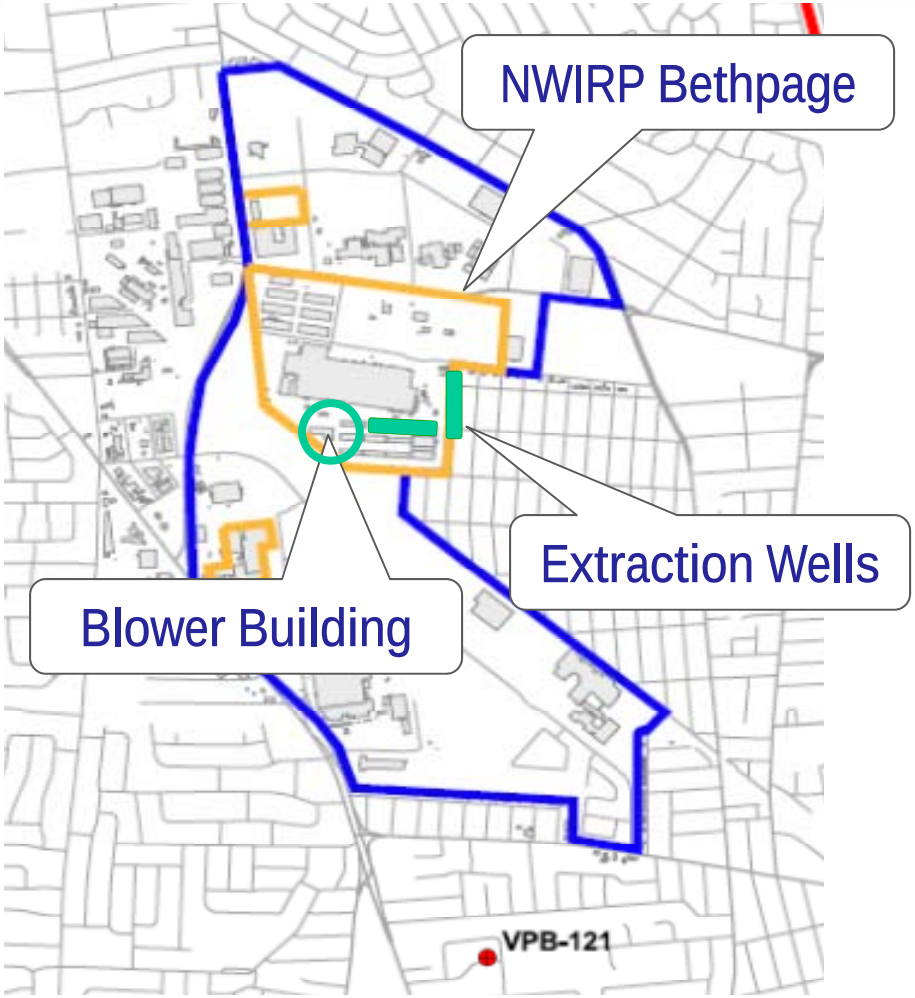
- Plant operates in compliance with air and SPDES permit guidelines.
- Runtime is near 95% with minimal downtime due to power outages and scheduled maintenance.
- Approximately 1,715 million gallons of water treated through April 2013.
- Collect monthly air and water compliance samples.
  - Submit monthly O&M compliance reports.
- Collect quarterly groundwater samples of surrounding monitoring wells.
  - Submit quarterly operations reports.

GM-38 GWTP Performance and Future Activities

- System will be operated until COC concentrations are similar to those in the surrounding aquifer.
- Optimization activities are ongoing:
  - Improve performance
  - Evaluate capture zone
  - Reduce operating cost

SITE 1 SVECS Project Overview

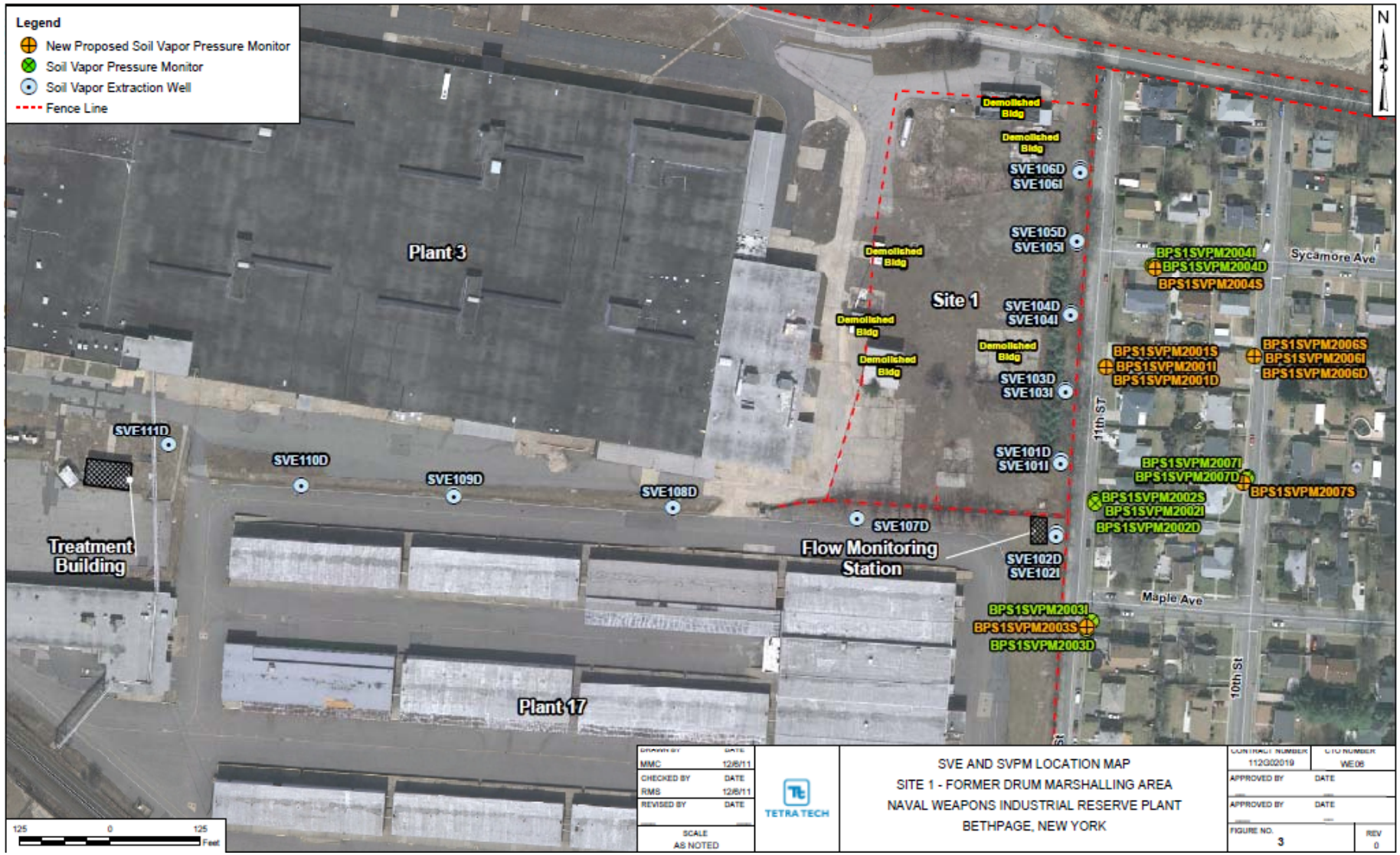
- Purpose: Prevent offsite migration of Site 1 VOC-impacted soil gas and cleanup offsite soil gas.
- System started operation in January 2010 and continues to operate.
- Extracts approximately 400 cubic feet per minute of soil gas from 12 wells located along Site 1 fence line. Five additional extraction wells added in October 2011 to address potential VOCs under Plant No. 3 and South Warehouse.



SITE 1 SVECS Operational Activities

- Nine additional SVPMs installed along 10th, 11th, and Sycamore Streets 5-6 September 2012.
- Quarterly vapor samples collected from 12 SVE wells (5 December 2012 and 15 January 2013).
- Annual vapor samples collected from 18 SVPMs on 15-16 January 2013.
- Quarterly SVPM monitoring of 18 SVPMs performed 5 December 2012 and 15 January 2013.
- Next quarterly event scheduled for mid-May 2013.

SITE 1 SVECS Offsite Soil Gas Monitoring



SITE 1 SVECS Performance and Future Activities

- Plant operates in compliance with air permit guidelines.
- Runtime is above 95% with minimal downtime due to power outages and scheduled maintenance.
- Collect monthly air compliance samples.
- Collect quarterly air samples of SVE wells and perform quarterly SVPM monitoring. Collect annual air samples of the SVPMs (winter time-frame).
    - Submit quarterly operations reports.

SITE 1 SVECS Performance and Future Activities

- System is expected to operate until approximately 2015.
- Optimization activities are ongoing:
  - Improve performance
  - Evaluate capture zone
  - Reduce operating cost

NAVFAC
Naval Facilities Engineering Command
NAVFAC MID-ATLANTIC

Restoration Advisory Board (RAB) Meeting

Site 1 and GM-38 Pumping Tests

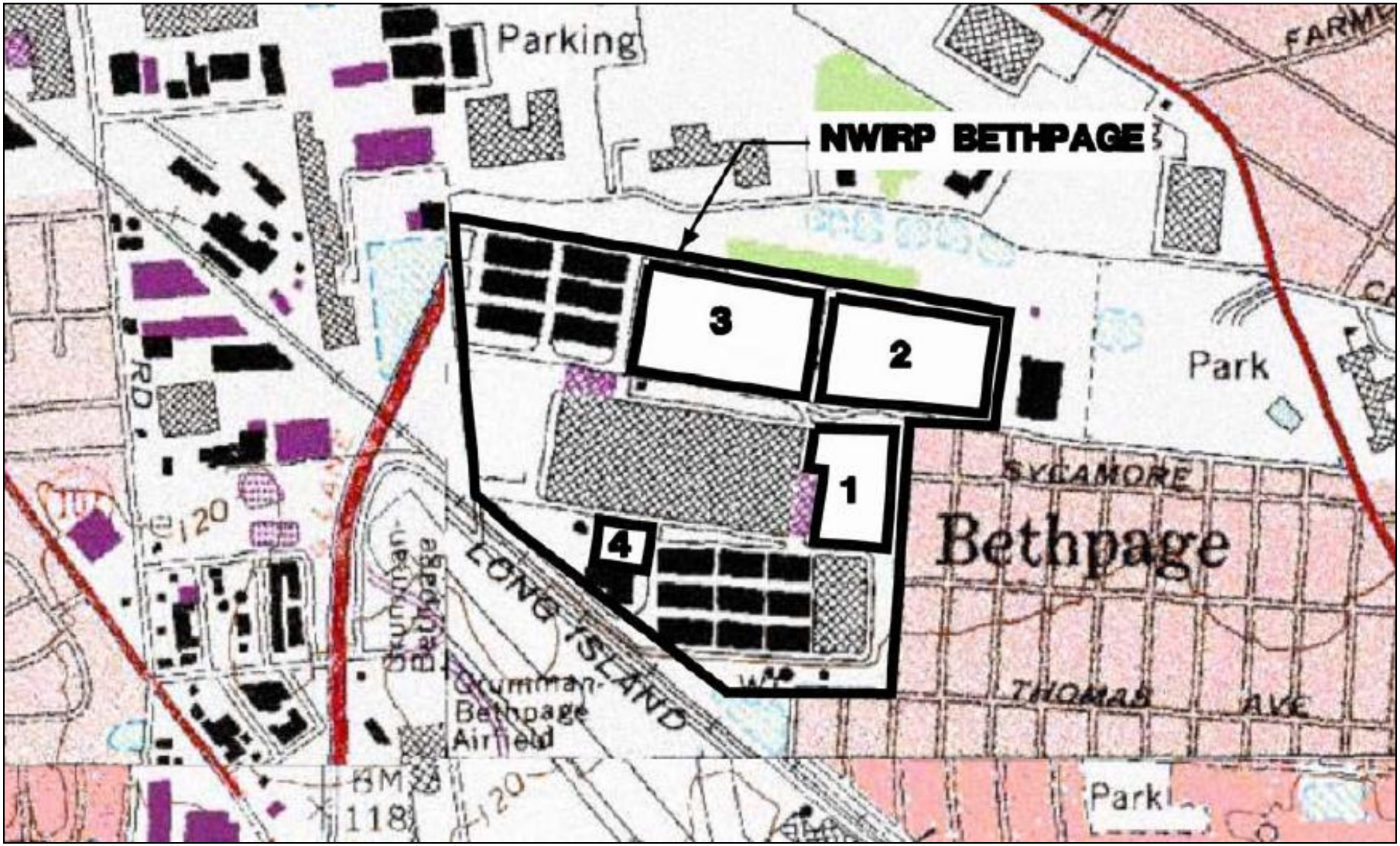
Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage

May 15, 2013

Presentation Outline

- Operable Unit 1 (OU1)
  - Site 1 Soil Investigations
  - Site 1 Groundwater Investigation (PCBs and metals)
  - Remedial Investigation (RI)/Feasibility Study (FS) Addendums
- AOC 32 Tanks
- OU2 – Offsite Groundwater
  - GM-38 Capture Zone Analysis

Site Location Map

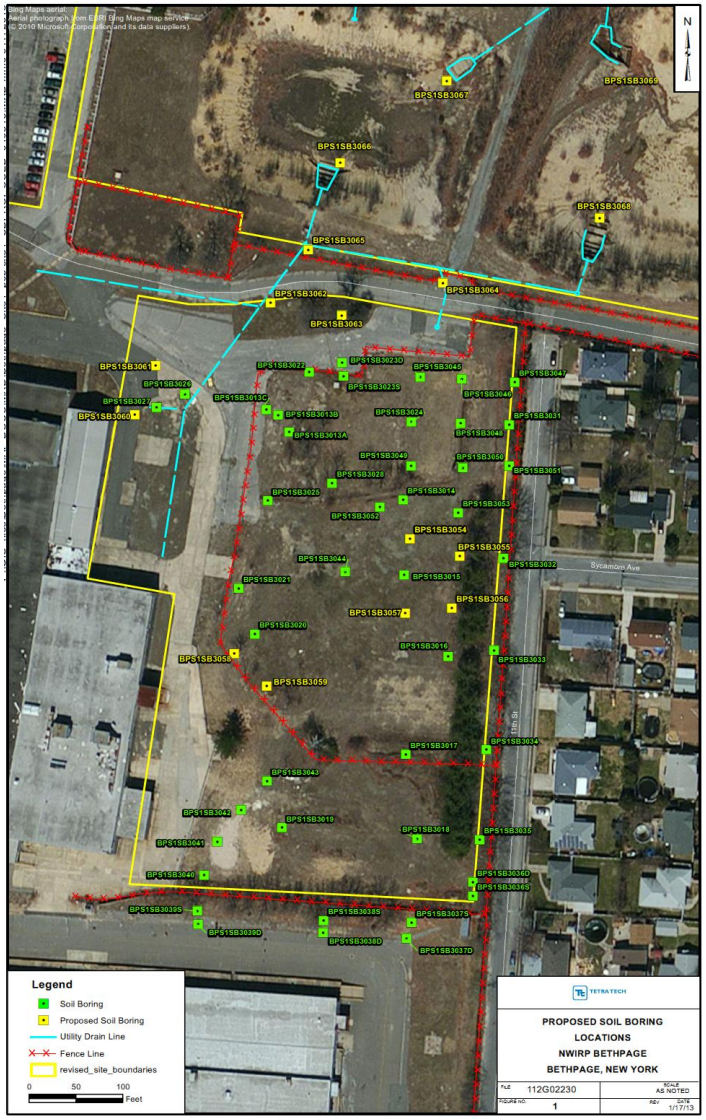


Site 1 – Soil and Groundwater Investigation

- Objective: Complete the delineation of soil and groundwater contamination in and around Site 1
- Investigation focused on polychlorinated biphenyls (PCBs) and metals (chromium), and to a lesser extent VOCs
- Soil borings and monitoring wells were installed
- The soil boring will be used to better delineate the extent of PCB-contaminated soil at Site 1 to support an Remedial Investigation (RI) and Feasibility Study (FS) Addendum
- Groundwater investigations are being conducted to determine whether Site 1 soil is affecting groundwater

Site 1 – Soil and Groundwater Investigation

- Complete soil investigation in June 2013
- Soil samples collected at depths of 0 to 75 feet below ground surface



Site 1 – Soil and Groundwater Investigation

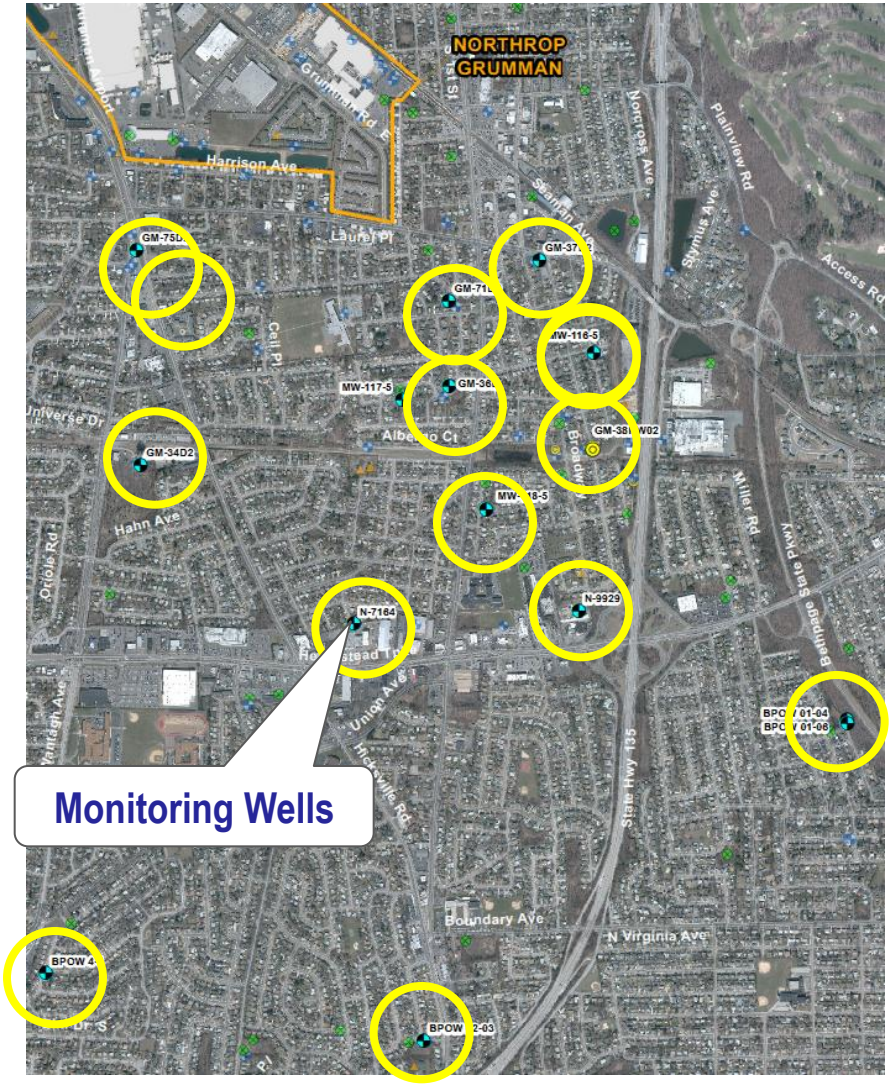
- Monitoring wells were installed at depths of 53 to 296 feet below ground surface
- Last round of groundwater samples collected in February 2013
- An RI/FS Addendum is planned for 2013

AOC 32 Tanks Summary

- Two USTs were identified during site grading activities (5,000 and 6,000 gallons)
- Historic documentation was very limited, but suggested the tanks were used to store toluene and then tetrachloroethene (PCE)
- Tanks were removed in Sept 2012
- Some of the contents were identified as hazardous
- Soil testing found no evidence of a release from the UST

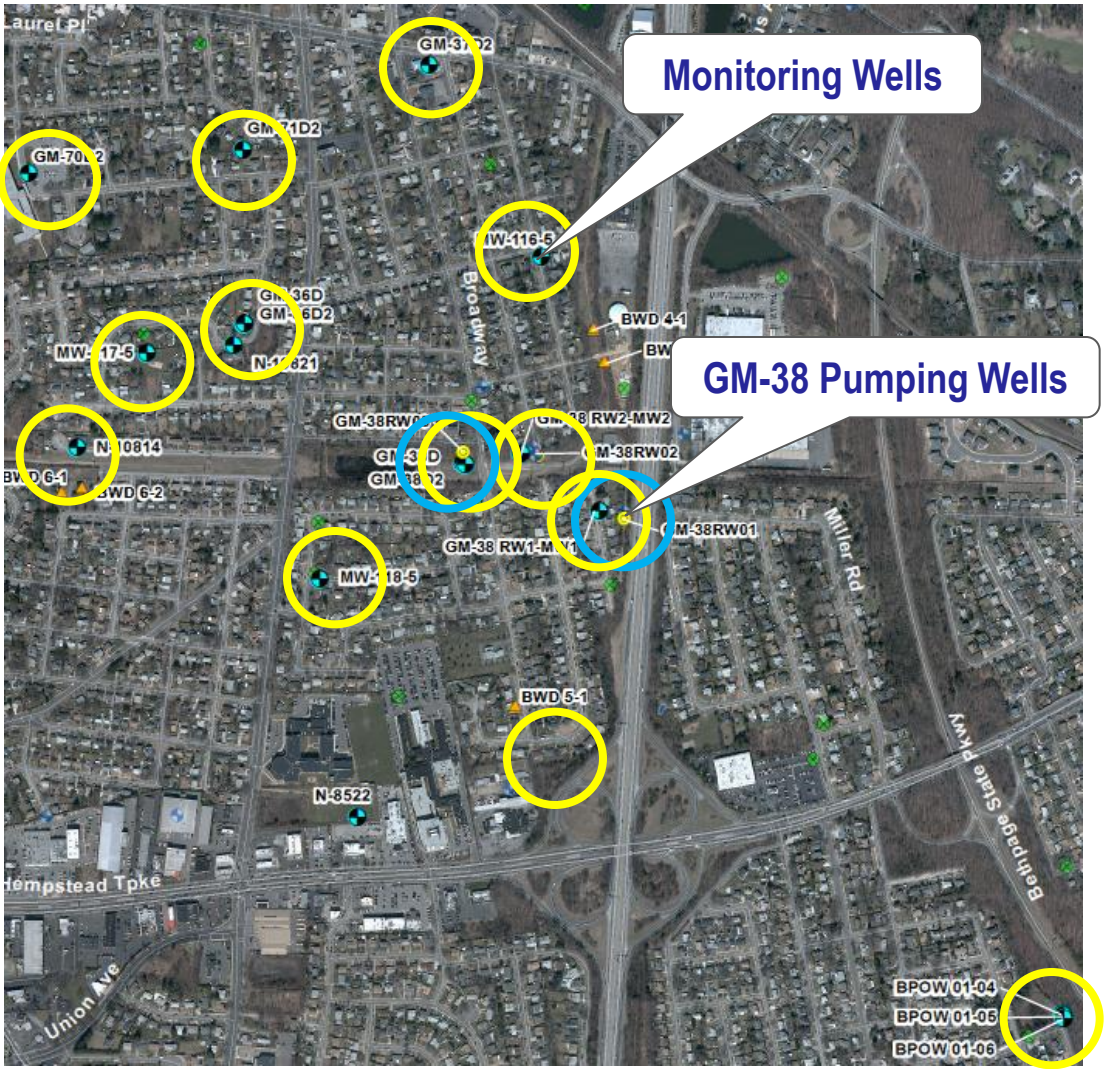
GM-38 Capture Zone Analysis

- Water level measurement will be collected over 12 months
- Data will be used to evaluate seasonal variations in water levels from weather and pumping



GM-38 Capture Zone Analysis

- GM-38 Pumping Test
- Controlled pumping of wells to evaluate capture zone for specific wells
- Data will be used by USGS to calibrate a model



Site 1 and OU2 Activities

Questions

NAVFAC
Naval Facilities Engineering Command
NAVFAC MID-ATLANTIC

Restoration Advisory Board (RAB) Meeting

OU2 - Offsite Groundwater Investigation
Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage
May 15, 2013

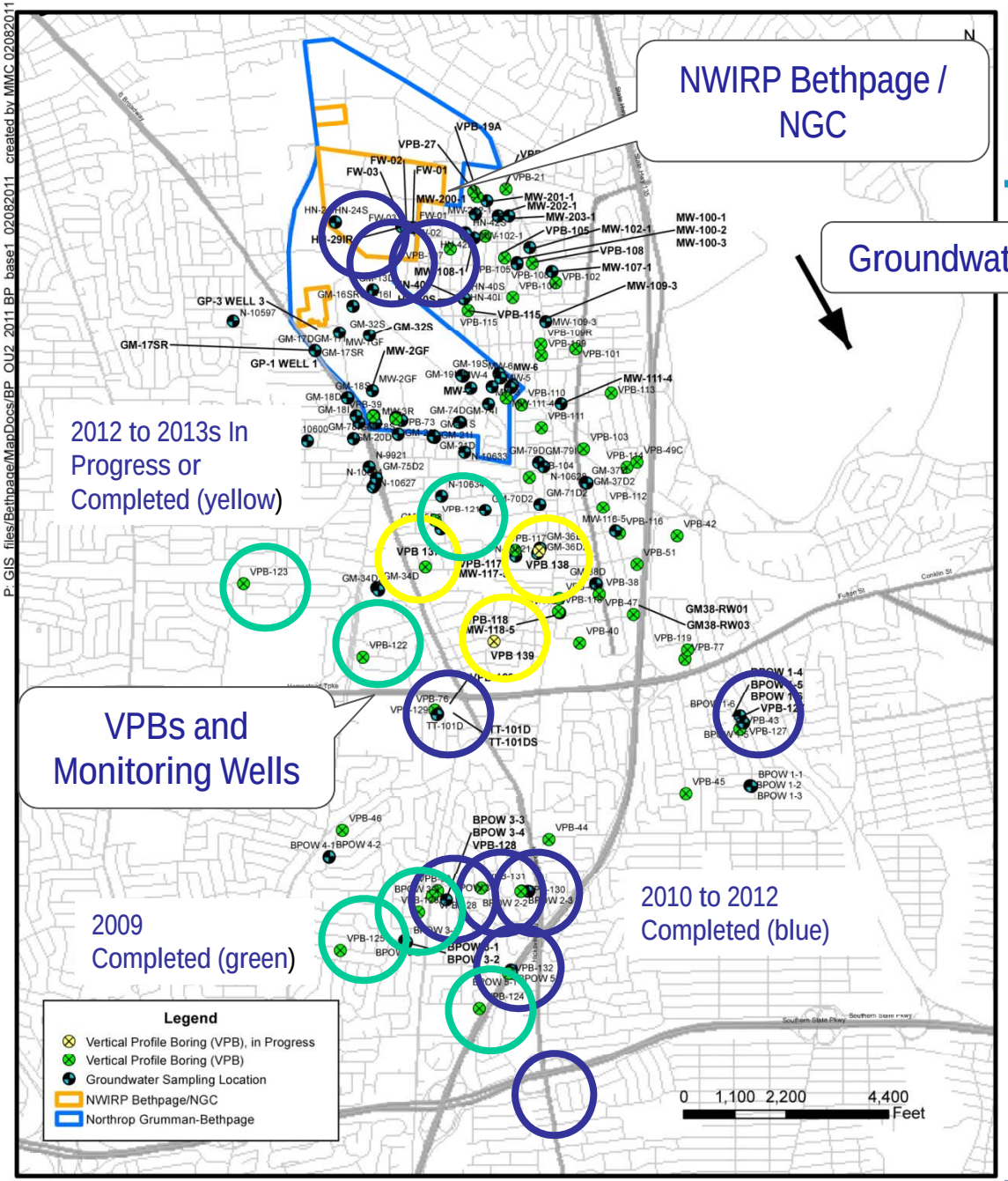
OU2 GROUNDWATER INVESTIGATION - PURPOSE

- Delineate groundwater contamination in areas south of NWIRP Bethpage
- Program consists of:
  - Vertical profile borings - used to quickly screen areas for the presence, depth, and concentration of contamination
  - Permanent monitoring wells - to confirm presence/absence of contamination and develop trends
  - Support capture zone analysis for wells

OU2 INVESTIGATION - VERTICAL PROFILE BORING PROGRAM

- A vertical profile boring is a 12-inch diameter hole drilled into the ground. At select depths, the drilling is stopped, a device is lowered to depth, and a sample of the water is collected
- The borings will extend to the Raritan Clay Layer at a depth up to 860 to 1000 feet below ground surface
- 36 groundwater samples are collected per boring and analyzed for VOCs
- Generally it takes 4 to 8 weeks to complete a boring/well

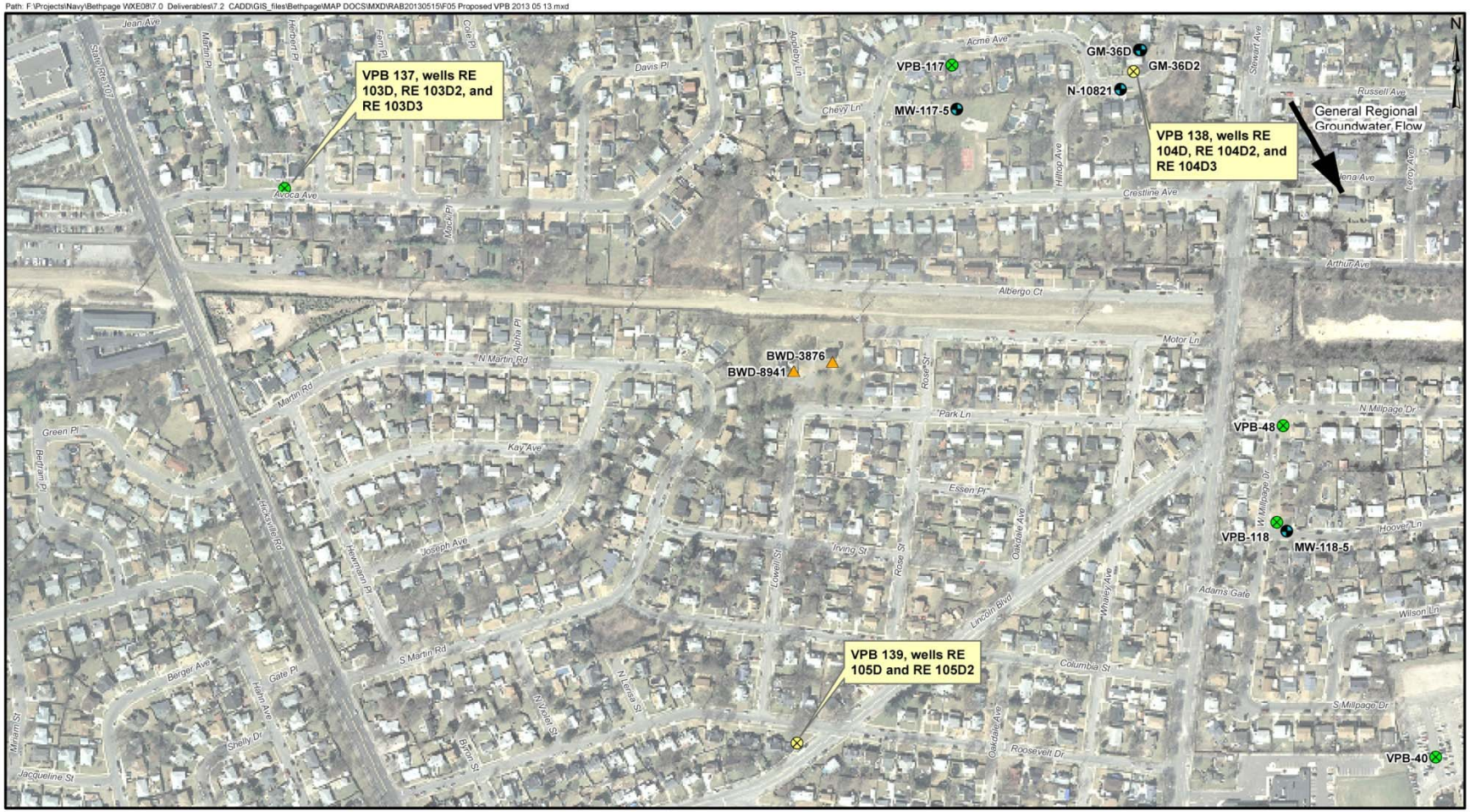
2009 to 2013 Vertical Profile Borings (VPBs) and Monitoring Wells



OU2 – CURRENT AND FUTURE VPB AND MONITORING WELLS

- Work performed since last RAB (December 2012)
  - –Installation of Vertical Profile Borings 137 and 138
  - –Installation of three associated wells at VPB137
  - – Three associated wells at VPB 138 currently being installed
- Future work:
  - – VPB 139 and associated well installations scheduled to start late summer 2013; additional borings/wells contingent on findings

OU2 – CURRENT AND FUTURE VPB's AND MONITORING WELLS



OU2 ACTIVITIES

Questions?