RESTORATION ADVISORY BOARD MEETING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), BETHPAGE
TOWN OF OYSTER BAY BETHPAGE SENIOR COMMUNITY CENTER
103 GRUMMAN ROAD WEST, BETHPAGE, NEW YORK
WEDNESDAY, NOVEMBER 6, 2013

The Thirty-second (32nd) meeting of the Restoration Advisory Board (RAB) was held at the Bethpage Senior Community Center in Bethpage, New York. Meeting attendees included representatives from the Navy (Lora Fly, Melissa Forrest), the Management Edge (Gayle Waldron), New York State Department of Environmental Conservation (NYSDEC) (Steven Scharf), New York State Department of Health (NYSDOH) (Steve Karpinski), Nassau County Department of Health (Joseph DeFranco), United States Environmental Protection Agency (USEPA) (Robert Alvey), Town of Oyster Bay (John Ellsworth), RAB Community Member (Sandra D'Arcangelo), H&S Environmental (Jen Good, John Hudacek, and Al Taormina), ARCADIS (Sunny Xu), Bethpage Water District (Michael Boufis), H2M (Paul Grainger-MWD), Massapequa Water District (Stan Carey), Steel Equities/Edgewater Environmental (Stephen Hix and Kevin Lumpe), United States Geological Survey (USGS) (Stephen Terracciano) and Resolution Consultants (Brian Caldwell, Robert McCarthy, Eleanor Vivaudou and Michael Zobel). There were several guests at the meeting, including twenty Bethpage residents, two residents from neighboring towns and representatives of the local television station (News 12). 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 presented the meeting agenda. Ms. Fly also introduced Gayle Waldron (Management Edge, serving the role of facilitator in support of the RAB), who then went over the Rules of Conduct. The Rules of Conduct is provided in Attachment 2. 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 about navigation of the public website for NWIRP Bethpage.

Ms. Waldron discussed the rules to ensure that the meeting follows the agenda and that everybody is allowed the opportunity to comment.

COMMUNITY UPDATE AND REVIEW AND APPROVAL OF MEETING MINUTES

Ms. Fly asked if there was a quorum of RAB members so that the prior minutes could be approved. The meeting minutes were said to be finalized.

NWIRP BETHPAGE RESTOATION ADVISORY BOARD (RAB) MEMBERSHIP DRIVE

Ms. Fly introduced Ms. Forrest who proceeded to explain the purpose of the RAB and the current status at Bethpage. A RAB is a public forum for the discussion and exchange of environmental cleanup information between the Department of Defense (DoD), State, Federal Regulatory Agencies and the local community. Ms. Forest stated that the RAB member's responsibility is to provide advice to the installation, regulators and other government agencies on environmental cleanup activities and community involvement by reviewing and commenting on documents, attending RAB meetings and serving as a liaison with the community and providing them with information discussed at the meeting.

A RAB has two co-chairs, one from the Navy and one selected by the community. RAB chairs are responsible for jointly determining meeting agendas, and serve as a focal point for community outreach as wells as performing various administrative duties. RABs are dissolved if all work is complete, if the property is transferred out of the DoD, or if 75 percent of the members agree in writing there is no longer sufficient interest to maintain a meeting.

The Bethpage RAB meeting was established in the late 1990's to address the cleanup activities associated with the former NWIRP at Bethpage. Currently the community co-chair is vacant and attendance is at one quarter of the goal. The Navy is updating the community involvement plan in 2014 and is accepting applications for RAB memberships. Meetings are held twice a year in November and May.

Several questions were posed pertaining to notification of the RAB meeting. A resident stated that they learned of the meeting through the Bethpage breast cancer support group. Ms. Fly stated that a notice was published in the Bethpage Tribune and previous attendees also received notification. Ms. Forrest reiterated that the RAB needs input from the community and encouraged attendees to contact her with suggestions and ideas. One immediate suggestion of a mass mailing to notify residents of RAB meetings was discussed. Another suggestion was placing the public notice in Newsday. The Navy responded that they will consider these as well as other options for public notification.

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

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

Ms. Good 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 volatile organic compounds (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 at least 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 November 2013. Ms. Good stated that nine additional soil vapor pressure monitor (SVPM) points were installed in September 2012. The total number of SVPM points is 18. The next annual sampling event is scheduled for January 2014.

The GM-38 GWTP is being operated to remove 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 December 2013. The system extracted an average of 36.9 million gallons and 91 pounds of VOC per month. To date, approximately 1,958 million gallons of water have been treated. Since the last RAB meeting, the system operated continuously, except for a shut down for 6 days to replace variable frequency drives damaged by a lightning storm. The system was shut down on October 27 for maintenance which consisted of replacing the existing duct work with stainless steel duct. Maintenance is projected to last 6-8 weeks. The Navy will continue to monitor the performance of the system, including collection of monthly air and water compliance samples and quarterly groundwater samples.

One resident requested clarification as to where the Navy property ended and the town property began, so that he could ascertain who to speak to about a damaged tree. Ms. Fly asked that he speak to her after the meeting so that his question may be addressed.

Another attendee wanted to know what mass of contaminants have been removed and the quantity of water treated at GM-38. Ms. Fly responded approximately 2 billion gallons and 7,500 lbs.

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

Status: Ms. Fly presented the status of the GM-38 Operation and capture zone analysis. The presentation is included in Attachment 3.

The objective of GM-38 GWTP operations is to reduce the future elevated mass contaminant load contained in the GM-38 hotspot (identified in the 2003 Record of Decision [ROD] as an area greater than 1000 ppb) to the down gradient public water supplies.

Groundwater is extracted from recovery wells RW-1 and RW-3 and treated in the GWTP. The treatment process consists of air stripping and vapor-phase carbon treatment, and liquid-phase carbon treatment.

To date, it has treated 2 billion gallons of water and removed 7,500 pounds of VOCs. 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 an evaluation of groundwater levels and pumping effects throughout the area. The USGS is working in conjunction with the Navy to evaluate the data through modeling.

GM-38 Capture zone analysis: The GM-38 system started operation in 2009 with one well. In March 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 (bgs) where over 1 parts per million (ppm) of trichloroethene (TCE) was located (a hotspot as defined in the ROD). Groundwater pumping testing in the GM-38 Area was conducted in March and April 2013, and the Navy is evaluating the effects to define the capture zone. This area-wide testing started in December 2012 and will go through December 2013.

The evaluation currently indicates that there is 98 to 100 percent capture of the GM-38 hot spot. Currently the Navy is evaluating shutdown of the system if it is determined the remedial goals have been met. The GM-38 Conceptual Design Report (October 2002) stated that the GM-38 wells were intended

to operate five to ten years to reduce the total volatile organic concentrations in the groundwater to 100 micrograms per liter, which will reduce concentrations similar to the surrounding plume area. A report on the capture zone evaluation will go out in December 2013.

Several questions were asked at the conclusion of Ms. Fly's presentation:
A question was posed regarding the need for the investigation of the hot spot and the surrounding area. The question was answered that the work is being performed to treat the hot spot and track the plume.

There was a question as to where the USGS map was located and is there a cross section of the entire plume? Ms. Fly answered that the USGS would need to be contacted concerning their maps and that the cross sections that the Navy prepared are on the NWIRP Bethpage website.

A resident asked the question if there was contamination in the soil near RW-2? Ms. Fly answered that contamination in the GM-38 area is limited to groundwater.

A question was posed as to the performance standard the system should meet before shutdown: 100 or 90 or 5 μg/L, and what happens if the MCL standard is changed to 0.5 ppm? Ms. Fly answered that the system will be evaluated to see if the levels are low enough to have met the remedial goals for the hot spot.

In answer to the question has the hot spot traveled? Ms. Fly answered that the hot spot has changed configuration and reduced in size because of the pumping of the GM-38 system.

In answer to the question what is the current thoughts of the hot spot being caused by OU3? Ms. Fly answered it was not certain, and that another source at Bethpage Community Park could possibly be contributing.

Mr. Caldwell continued with a discussion of the offsite groundwater investigations. The purpose of the OU2 groundwater investigation is to delineate the area of deep groundwater contamination south of NWIRP Bethpage. 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 (VPB) 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 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 Corona Drive. Mr. Caldwell also indicated that the summary report for VPBs 137, 138 and 139 will be prepared by January 2014.

Mr. Alvey asked if once the completed VPB has been sampled, based on contamination, has the Navy considered installing a screen in the VPB borehole? Mr. Caldwell answered that it normally takes 4-8 days to get and review the data for selecting well screen intervals. If the borehole is allowed to remain open during that time, the boring may collapse and require an extensive amount of work to recover the hole. If a basal gravel zone well is targeted for a given area, and the depth of the gravel layer can be confirmed in the field, then this approach may be considered. Multi-level sampling port wells such as Westbays are also being considered.

In answer to the question of how many crews are on site, Mr. Caldwell stated that currently there is one and the Navy plans to add a second one by the first half of December.

A question was asked if there was a difference between groundwater and drinking water. Ms. Fly stated groundwater is water that is present in the aquifer. It becomes drinking water after the water districts extracts, tests and if necessary treats the water before distributing it to the public.

Several residents provided general comments on the overall program that were not specific to the agenda. The Navy will consider these topics in the future.

Other questions asked were:

- How do I know I am not sick because of where I live? It was suggested that the resident talk to the NYSDOH. Mr. Karpinski of the NYSDOH stated that he had run into this question multiple times.
- Are people being exposed? No direct vapor exposures are occurring; since the contamination is deep below ground. As for direct exposure through drinking, contamination is not being detected above the health standards in treated water that is distributed by the water district.

A resident asked that if they are not exposed now and possible exposure is mitigated at the wellheads before we are exposed, what is the impact of that? Why is the money spent? The resident further questioned that if the public is not exposed why continue to look for contamination? The response give

was that the groundwater plume needs to be defined so that systems are in place to continue to mitigate the potential of public contact.

There were a couple of questions from a resident about a residue on her water filter. Mr. Karpinski stated that it would not be likely caused by VOCs, but more likely caused by iron; this cannot be commented upon without further information.

In answer to the question; if a Bethpage cancer study was performed that comes back with high data, is additional work done? Mr. Karpinski stated that he did not have an answer at this time. Another question posed was why a conclusive cancer study cannot be done? How can it be determined there was no impact in the past? Mr. Karpinski replied that there was no impact now, but we cannot tell what has happened in the past.

Another question was raised about whether the Grumman wells on-site were checked for radionuclides. Ms. Fly responded that the Navy did not have information about Grumman wells. Mr. Karpinski stated the NYSDOH is looking into the recent detections in the BWD wells, and the current consensus is that it is naturally occurring. The issue is still being evaluated. Mr. Karpinski stated that he would have someone from the NYSDOH radiation group to follow up with her.

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 April 2014. Ms. Fly thanked everyone for coming to the meeting and the meeting was adjourned.

ATTACHMENT 1

NOVEMBER 6, 2013 RAB MEETING SIGN-IN SHEET

32nd RAB Meeting for NWIRP Bethpage
November 6, 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?
Robert M. Alvey			
Sunny Xu			
Steven Schaf			
Joseph DeFranco			
Steve Karpinski			
[illegible]			
Michael Boufis			
Stan Carey			
Denise Florio			
Maureen O'Brien			
Jeanne O'Connor			
Mike Zobel			
Jen Good			
Eileen Valenza			
Stephen Terracciano			
John Ellsworth			

32nd RAB Meeting for NWIRP Bethpage
November 6, 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?
Lindsay Mcgowan			
Donna Devito			
Robert Horan			
Ken Kearney			
Kelly Chalmers			
Joyce Marinacci			
Josie Schmitt			
David Sobolow			
[illegible]			
Cynthia [illegible]			
Al Taormina			
John Hudacek			

32nd RAB Meeting for NWIRP Bethpage
November 6, 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?
Joanne Perino			
Stephen Hix			
PAUL GRAHAM			
SANDRA D'ARCANGELO			
Judith MASINO			
Francis G. Masino			
Wanda & Pete O'Malley			
Fran Trotter			

32nd RAB Meeting for NWIRP Bethpage
November 6, 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?
W Anderson			
E Dooley			
Eleanor Vivadow			

ATTACHMENT 2

NOVEMBER 6, 2013 RAB MEETING AGENDA and RULES OF CONDUCT

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: November 6, 2013

Time: 7:00 PM

Location: Bethpage Senior Community Center

- General overview – *Navy*
- Distribution of minutes – *All members*
- Status Update – *Navy*
- Community Involvement Plan - *Navy*
- Site 1 Soil Vapor Extraction Containment System Performance – *H & S*
- GM-38 Operations – *H & S*
- GM-38 capture Zone analysis – *Tetra Tech*
- OU-2 Offsite Groundwater Investigation Installation of VPB – *Resolution*
- Closing remarks – *Navy*

RESOLUTION CONSULTANTS

Bethpage Rules of Conduct

1. Respect others:
   - One Speaker at a time
   - No interruptions
   - No side conversations
   - Ask questions

2. Listen and stay open to all points of view

3. Stay focused on the topics; avoid digressions

4. Turn cell phones and/or pagers off, or on vibrate, and respond during breaks, except for emergencies.

5. Hold all questions until end of each presentation.

6. All Navy documents are at
   - http://go.usa.gov/DyXF
   - Bethpage Public Library
     47 Powell Avenue
     Bethpage, NY 11714

ATTACHMENT 3

PRESENTATIONS

NWIRP Bethpage Restoration Advisory Board (RAB) Membership Drive

Melissa Forrest
Navy and Marine Corps Public Health Center
November 2013

Overview

- What is a RAB?
- What's involved in being a RAB Member?
- How does a RAB operate?
- NWIRP Bethpage RAB status

RAB Definition

"A public forum for the discussion and exchange of environmental cleanup information between the Department of Defense, state and federal regulatory agencies and the local community"

A RAB may only address issues associated with environmental cleanup activities.

RAB Purpose

To give members of the public an opportunity to

- learn about Department of Defense environmental cleanup projects and
- provide input, opinions, and concerns to project managers **throughout the process**.

RAB Members

- Local citizens
- Navy representatives
- U.S. Environmental Protection Agency representatives
- State environmental regulatory agencies representatives
- Local government representatives

RAB Member Responsibilities

Provide advice to the installation, regulators, and other government agencies on environmental clean-up activities and community involvement by:

- **Reviewing** and commenting on various technical documents and related site information;
- **Attending** RAB meetings and discussing and exchanging information regarding site cleanup;
- Serving as a **liaison** with the community and providing them with information discussed at the RAB meetings

RAB Co-Chairs

Each Restoration Advisory Board is chaired by two people, a Navy representative and a community representative.

- The Navy representative is selected by the installation's Commanding Officer.
- The community representative is selected by the community members.
- The co-chairs serve as equal partners.

RAB Co-Chair Responsibilities

All RAB member responsibilities **PLUS**:

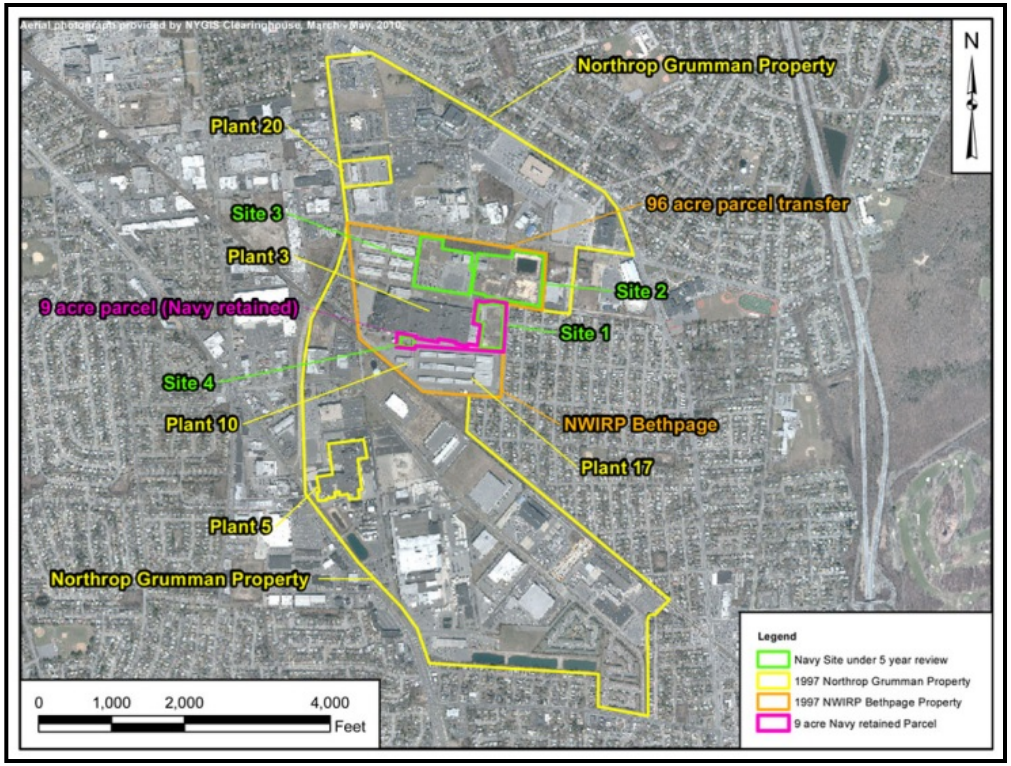
- Jointly determine meeting agendas
- Act as focal point for community outreach
- Various administrative duties

Dissolution of DoD RABs

- If all required work is complete
- If the property is transferred out of DoD
- If 75% of members agree in writing
- If there is no longer sufficient, sustained community interest

Bethpage RAB

- Established in the 1990s.
- Deals solely with the study and potential cleanup activities at the former NWIRP Bethpage.



Bethpage RAB Guidance

- **Department of Defense RAB Rule**
  - Establishment
  - Characteristics
  - Composition
  - Funding
- **Bethpage RAB Charter**
  - Membership
  - Responsibilities
  - Operating Procedures
  - Dissolution of the RAB

Bethpage RAB Members

- **Local citizens –**
  - goal between 10 and 20 with diverse backgrounds - **Currently 1 to 5 attend**
  - Community Co-Chair – **Currently vacant**
- **Navy representatives**
  - One official member – Navy Co-Chair, Lora Fly
  - Other Navy/contractor participants are to provide information
- **Regulators**
  - New York State Department of Environmental Conservation (NYSDEC) – Steve Scharf
  - New York State Department of Health – Steve Karpinski

Bethpage RAB Meetings

- RAB meetings are held 2 times a year (November and May)
- Additional meetings are scheduled as needed
- RAB Meeting advertisement and reminders
  - NWIRP Bethpage Website
  - Letters and E-mails to RAB Members and Attendees
  - Bethpage Tribune
- All meetings are open the general public.

Running the Meetings

- **RAB meetings should be run jointly by the Co-Chairs – currently only a Navy Co-Chair**
- **The Navy is introducing the use of a professional Facilitator**
  - Facilitator's Role is to ensure the meeting stays on track while providing everyone equal opportunity to comment on agenda items and presentations.
  - Facilitator will be neutral and have no decision-making authority

Bethpage RAB Membership Drive

- The Navy is preparing to update the Bethpage Community Involvement Plan (CIP) in 2014
- CIP Update will include community interviews to determine
  - how people would like to obtain information about the environmental cleanup program and
  - if there is enough interest in the community to sustain the RAB
- The Navy is currently accepting applications for RAB membership

Interested Community Members

- Please talk with me tonight or contact me:

Melissa Forrest,
Navy and Marine Corps Public Health Center,
757 953-0946 or email at
sarah.forrest@med.navy.mil

Restoration Advisory Board
(RAB) Meeting

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

Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage

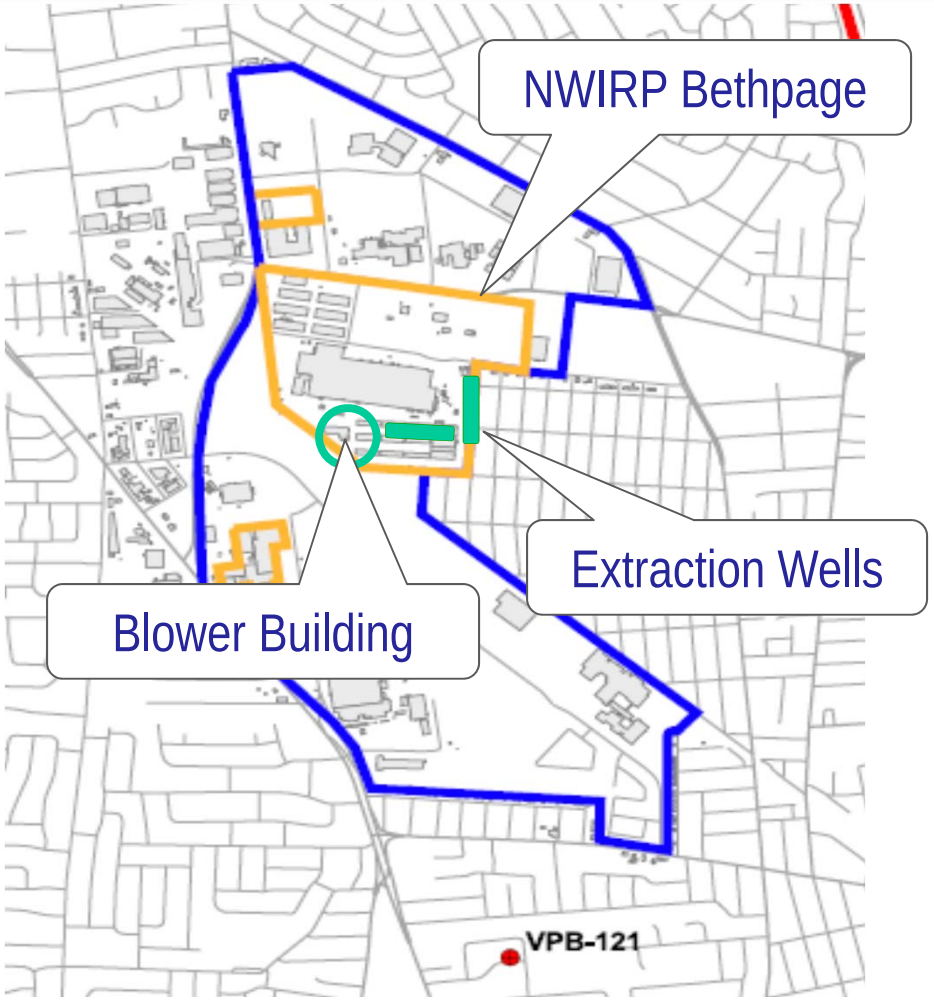
11/06/2013

Presentation Agenda

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

SITE 1 SVECS Project Overview

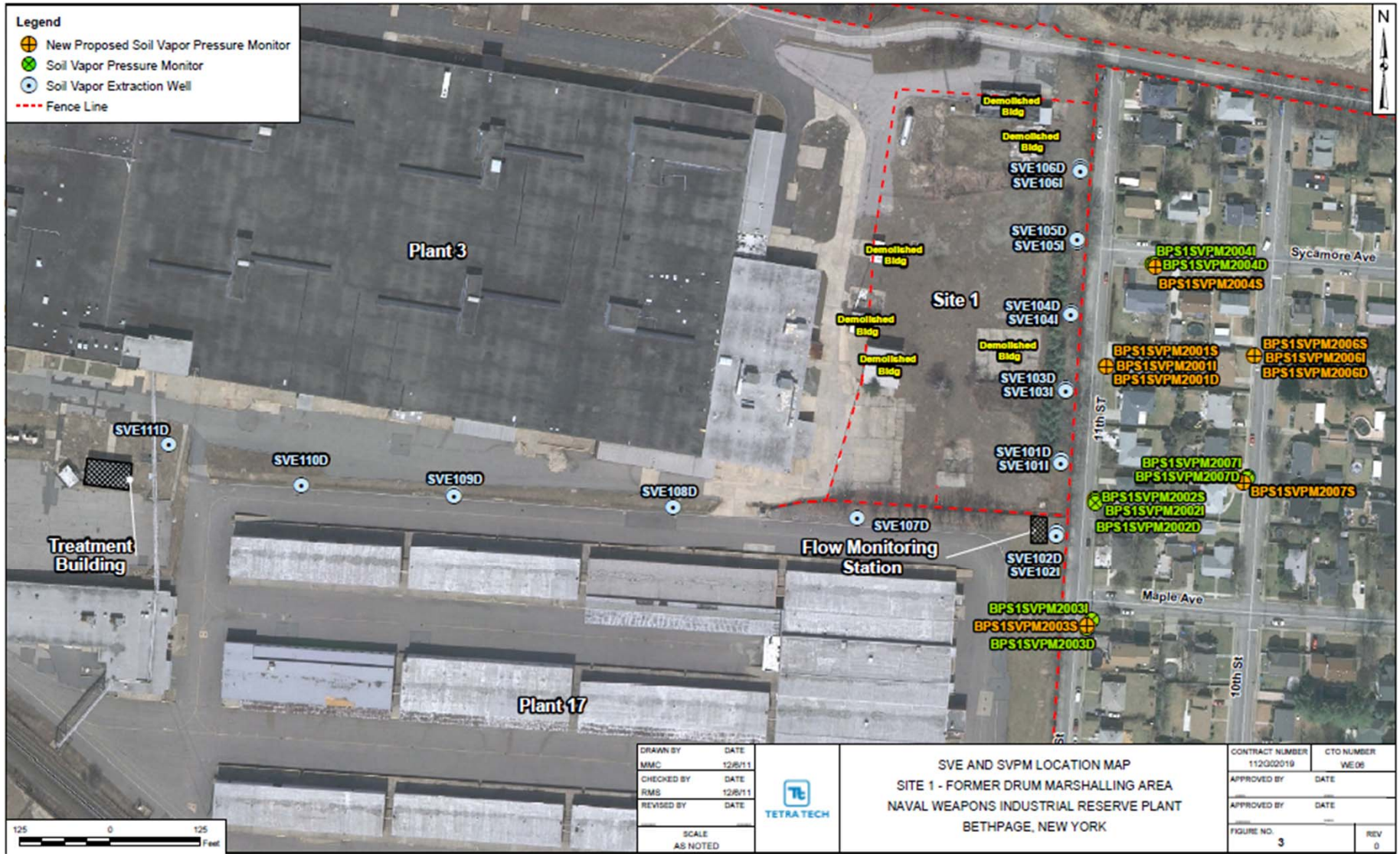
- Purpose: Prevent offsite migration of VOC vapors.
- System began operation in January 2010.
- Extracts approximately 400 cubic feet per minute of soil gas from 12 wells located along Site 1 fence line. Five additional extraction wells added in October 2011 to address potential on property sources.



SITE 1 SVECS Operational Activities

- Quarterly vapor samples collected from 12 SVE wells (May 2013 and August 2013).
- Total of 18 SVPMs located throughout neighborhood.
- Quarterly SVPM monitoring (vacuum readings) of 18 SVPMs performed May and August 2013.
- Annual vapor samples collected from 18 SVPMs in January 2013. Next annual event scheduled for January 2014.
- Next quarterly vapor monitoring event scheduled for mid-November 2013.

SITE 1 SVECS Offsite Soil Gas Monitoring

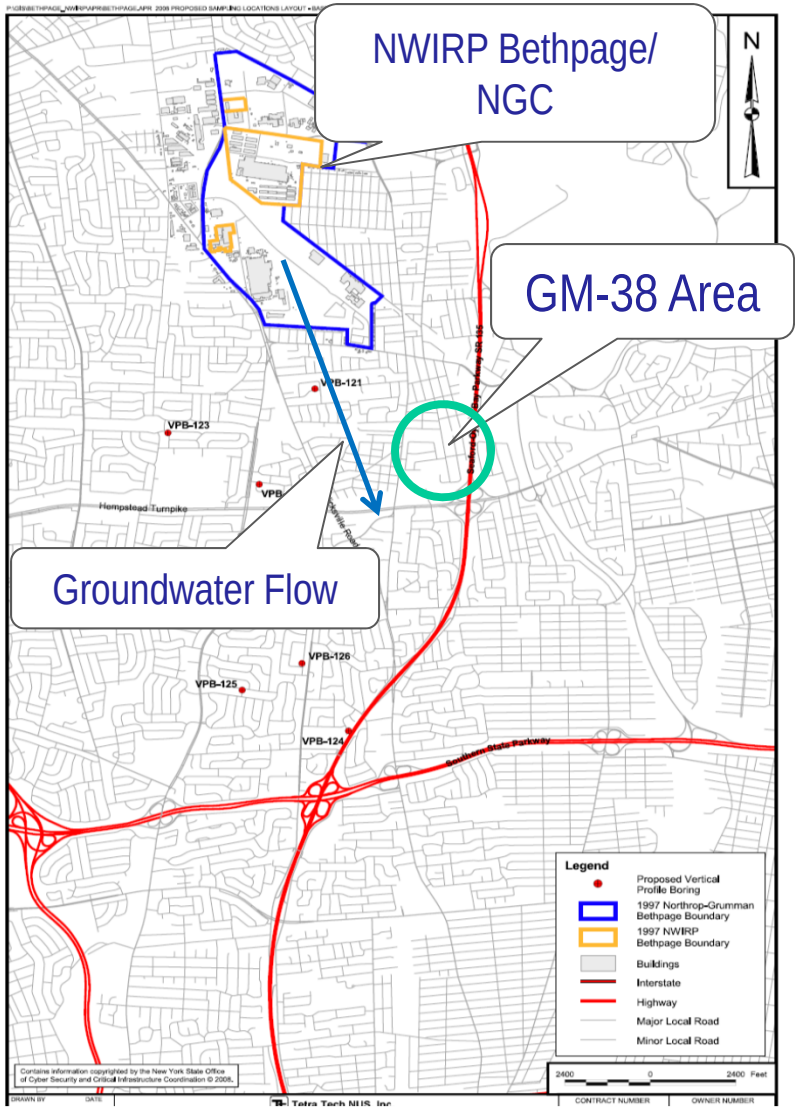


SITE 1 SVECS Performance and Future Activities

- 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.
- System is expected to operate until approximately 2015.

GM-38 Project Overview

- System began operation in October 2009.
- In 2013 (through end of October), system extracted average of 36.9 million gallons of water and 91 pounds of VOCs per month.



GM-38 REMEDIAL ACTION

GM-38 GWTP Operational Activities

- Quarterly groundwater monitoring events performed in June and September 2013.
  - Routine monitoring events – samples collected from eight monitoring wells.
  - Next quarterly event scheduled for December 2013.

GM-38 GWTP Operational Activities

- System down for 6 days to replace variable frequency drives damaged by September 2013 storm.
- System shut down 27 October 2013 for scheduled maintenance:
  - Replacement of existing duct work with stainless steel duct.
  - Projected time-line: 6-8 weeks

GM-38 GWTP Performance and Future Activities

- Plant operates in compliance with air and SPDES permit guidelines.
- Average runtime is near 95% with minimal downtime due to power outages and scheduled maintenance.
- Approximately 1,958 million gallons of water treated through October 2013.
- Complete ductwork modifications.
- Collect monthly air and water compliance samples.
- Collect quarterly groundwater samples of surrounding monitoring wells.

GM-38 GWTP Performance and Future Activities

- Optimization activities are currently in progress:
  - Evaluate and improve system performance
  - Reduce operating cost

GM-38 OPERATION AND CAPTURE ZONE EVALUATION
NOVEMBER 2013 RESTORATION ADVISORY BOARD (RAB)

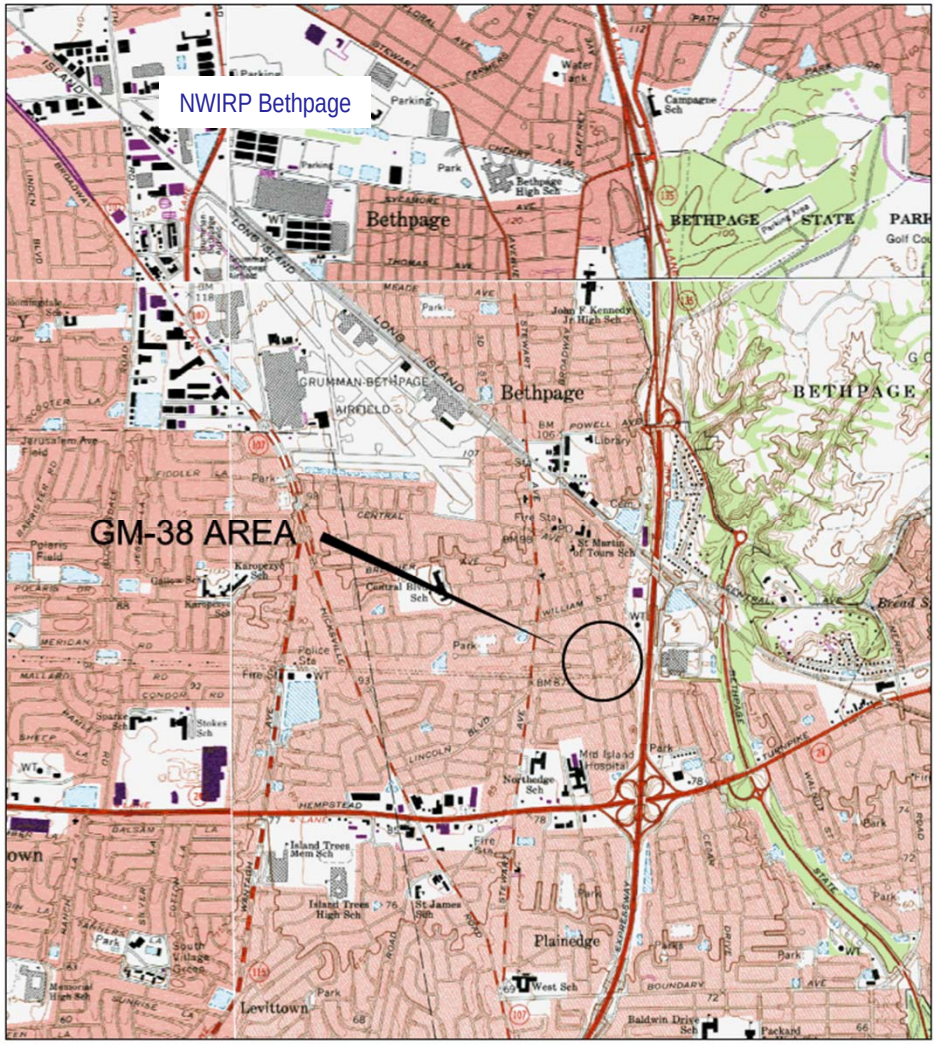
NWIRP BETHPAGE
LONG ISLAND, NEW YORK

11/06/2013

Introduction

GM-38 Groundwater Extraction, Treatment, and Discharge System

- Objective
- Construction and Operation
- Capture Zone Evaluation
- Shutdown Evaluation



Objective

From the Operable Unit (OU2) Record of Decision (April 2003):

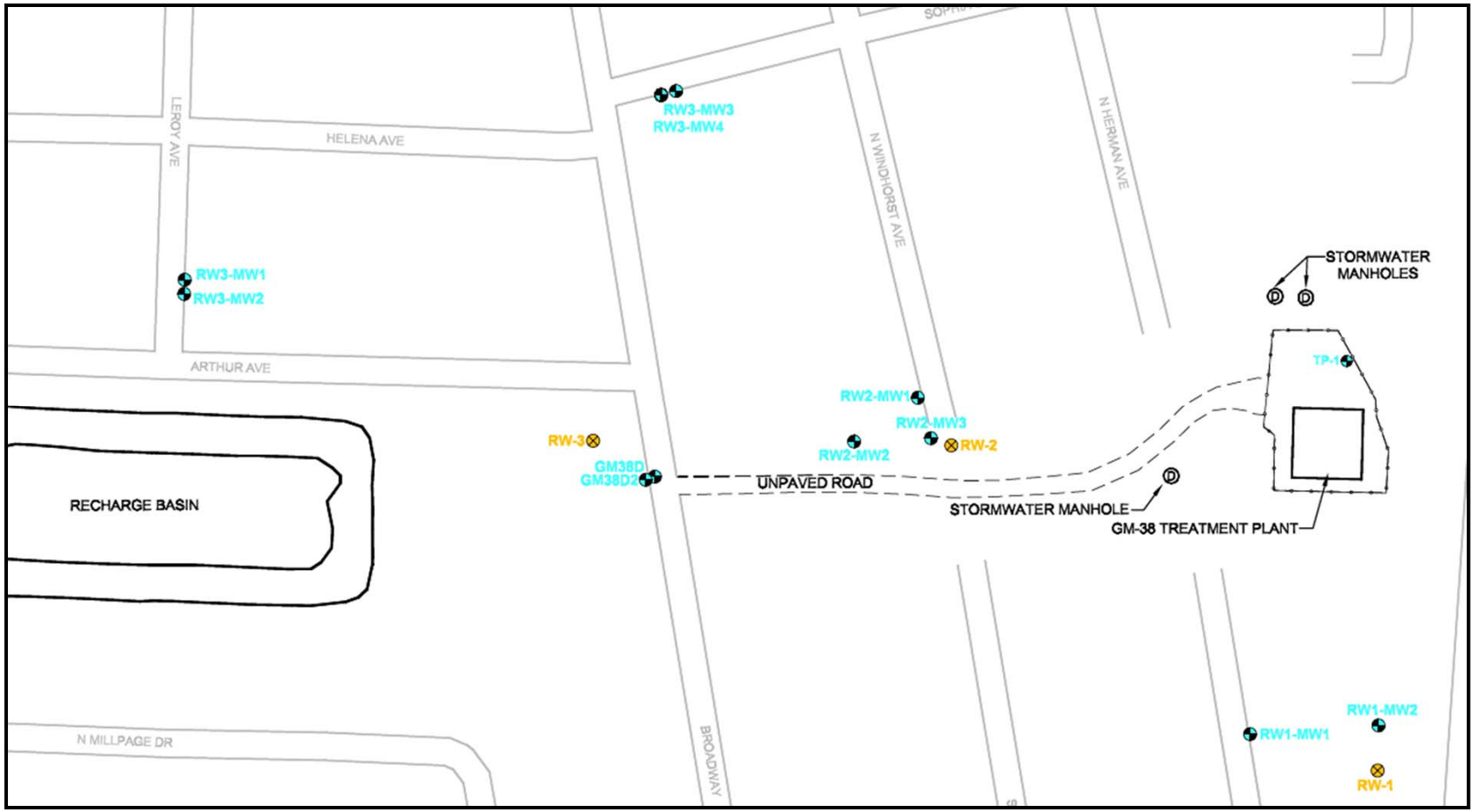
- "The main objective of the GM-38 well area remedy would be additional protection of human health by reducing the future elevated mass contaminant load to the down gradient public water supplies. The remedy would also enhance the long-term natural process of aquifer restoration."

Construction and Operation

- GM-38 System consists of the following components:
  - Two groundwater recovery wells RW-1 and RW-3
  - Equalization Tank
  - Air Stripping Tower
  - Liquid Phase Granular Activated Carbon Polishing
  - Discharge to a Recharge Basin
  - Vapor Phase Treatment using Granular Activated Carbon and Permanganate-Based Resin
- Since Startup, System has treated:
  - 2 Billion gallons of water (2.2 times the Hotspot Volume), and
  - 7,500 pounds of VOCs
- Operated in Full Compliance with Water and Air Discharge Limits

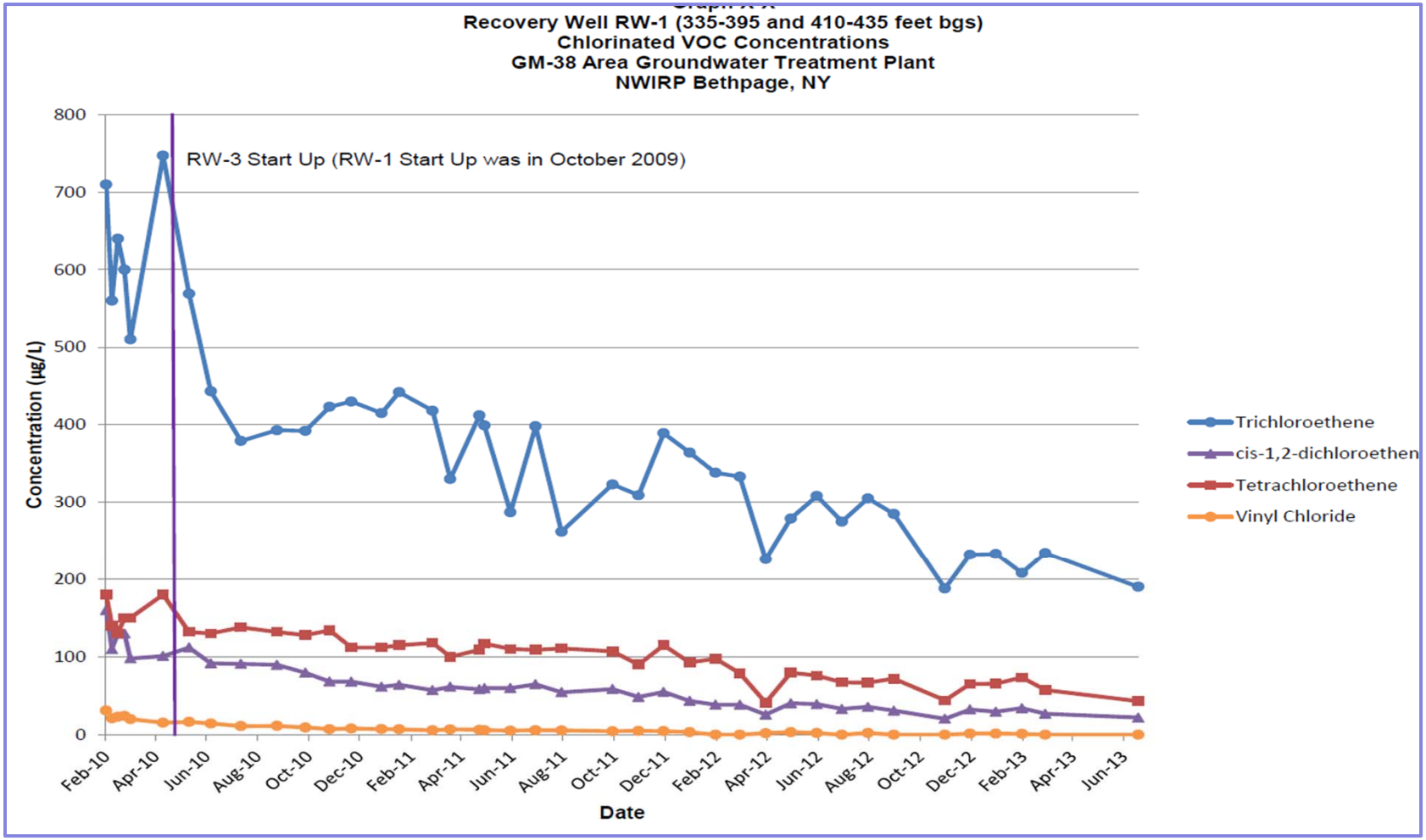
Construction and Operation

GM-38 Area Monitoring and Recovery Wells



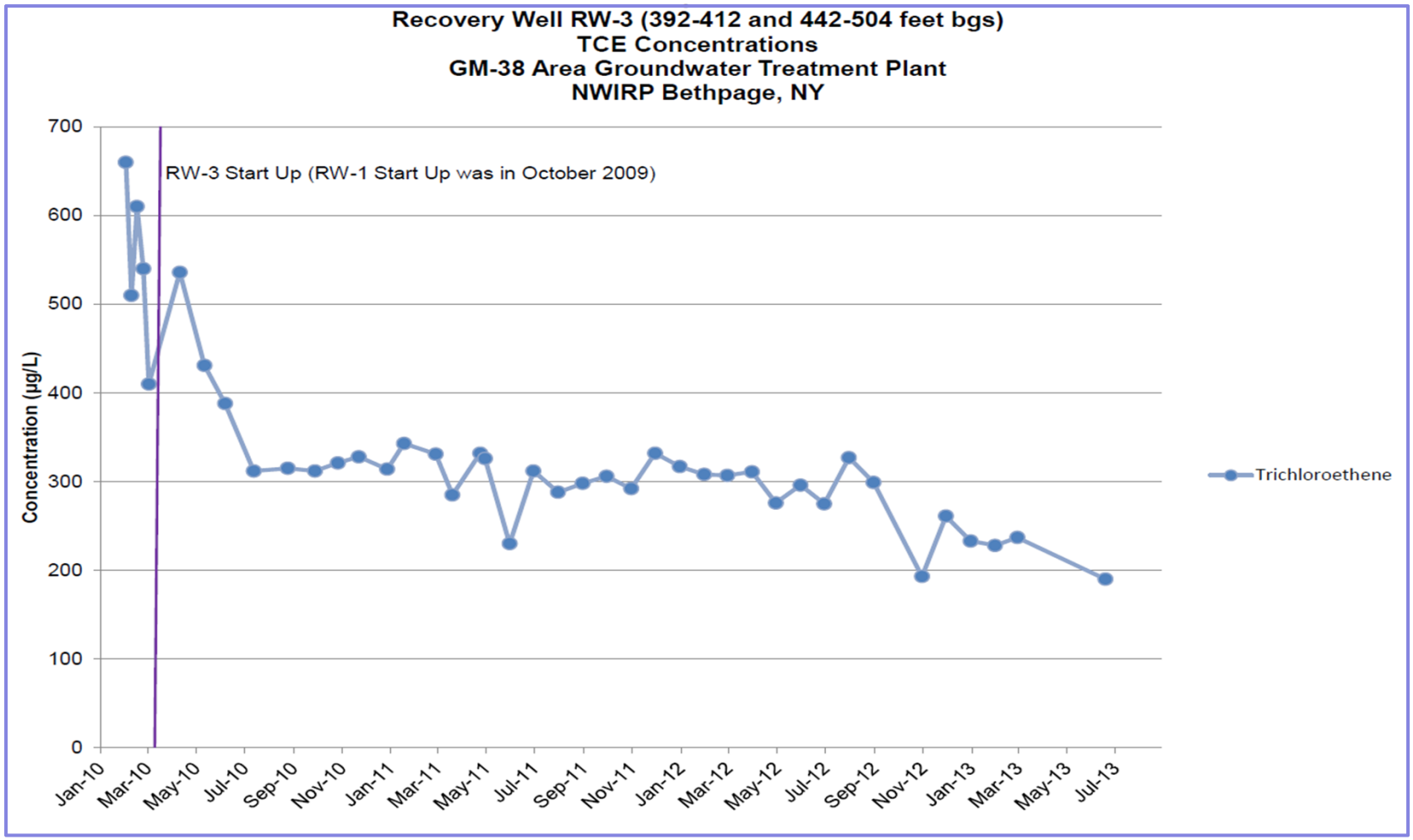
Construction and Operation

Recovery Well RW-1 Trend Analysis



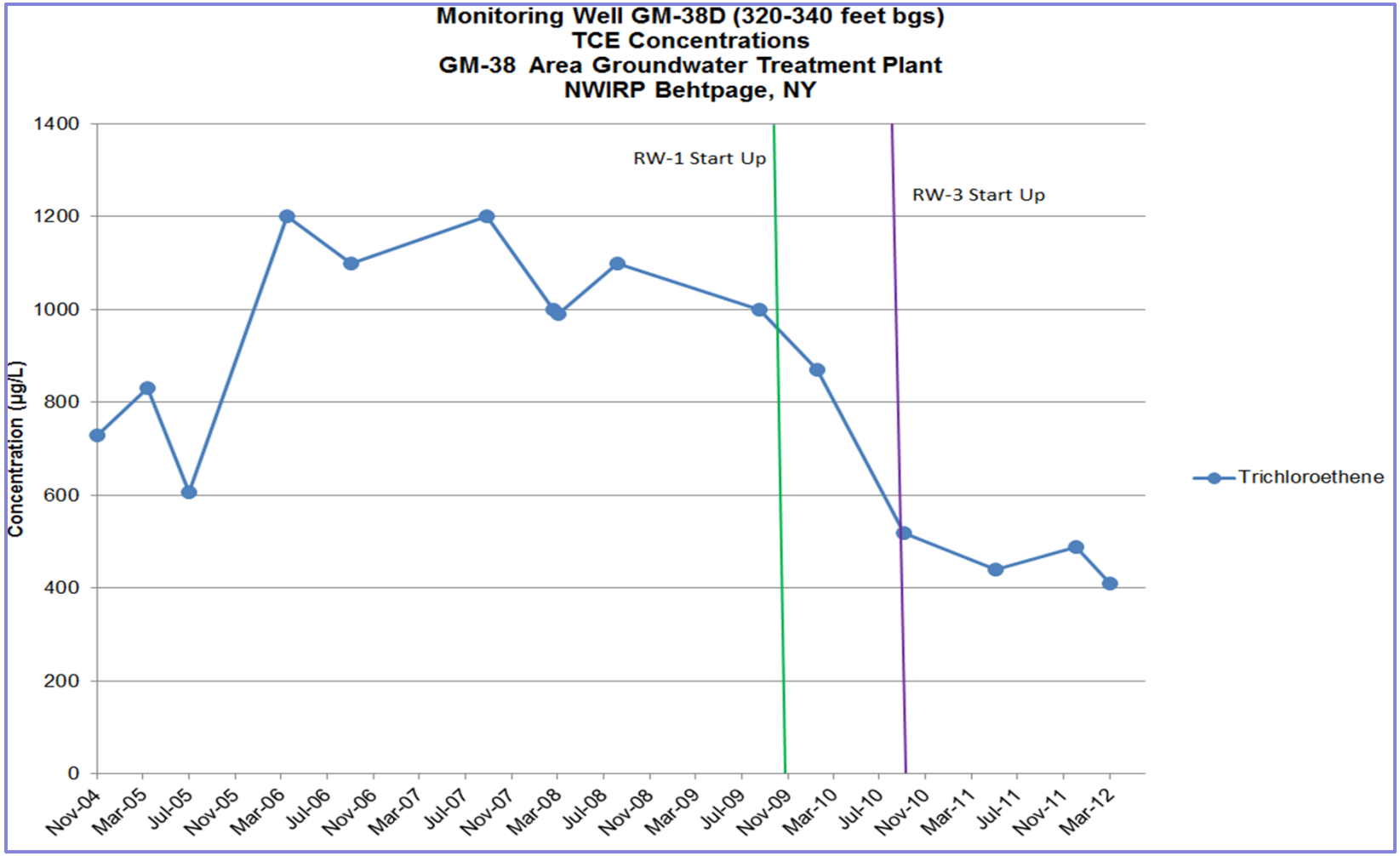
Construction and Operation

Recovery Well RW-03 Trend Analysis



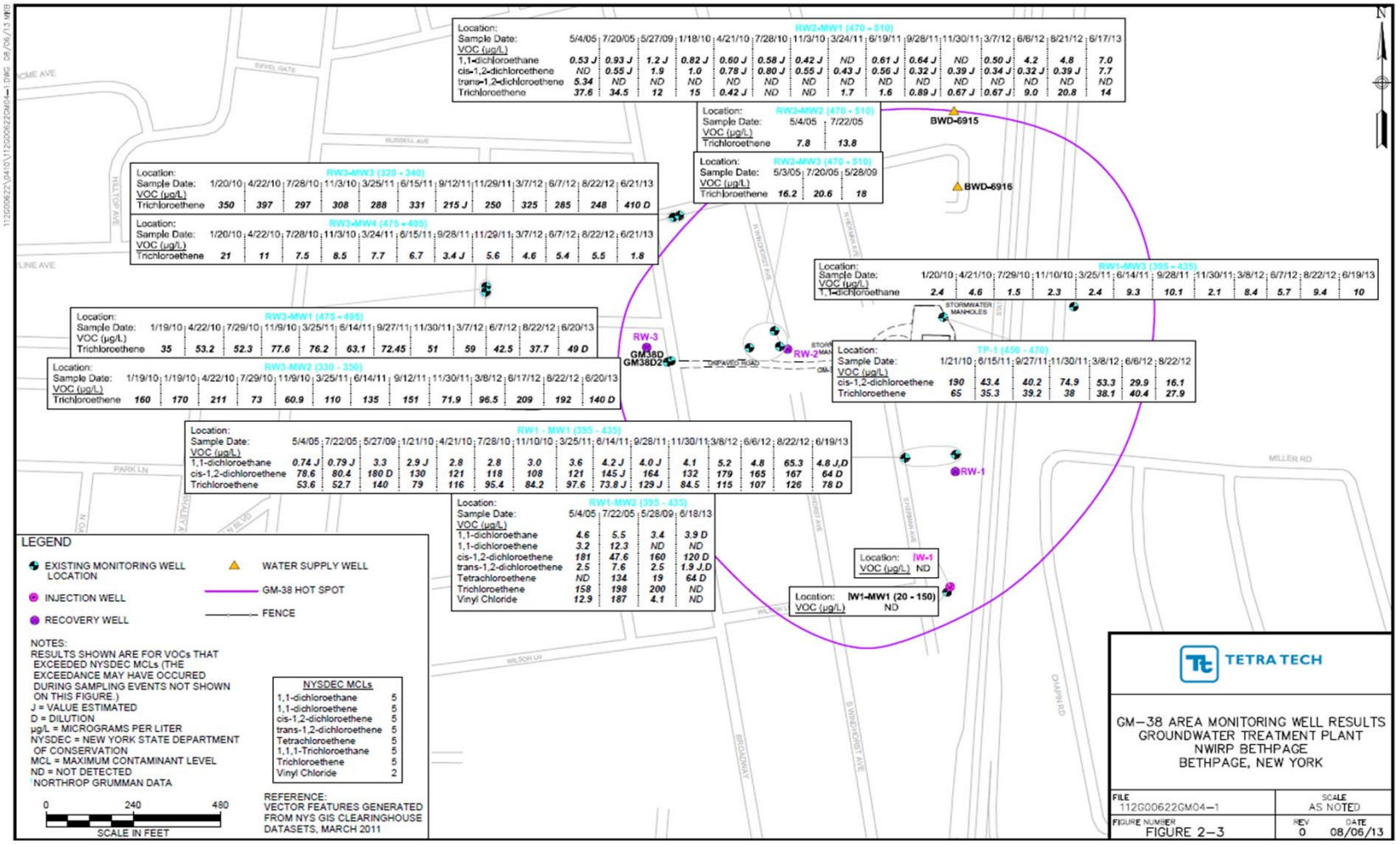
Construction and Operation

Monitoring Well GM-38D Trend Analysis



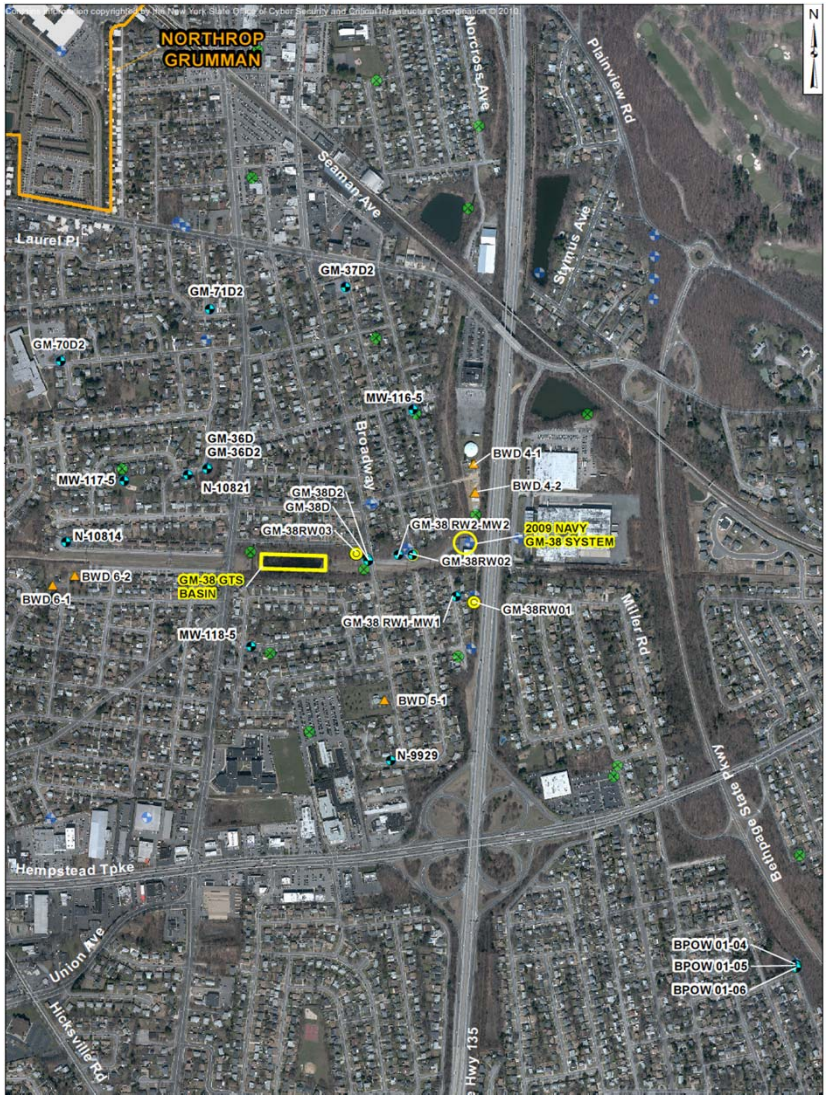
Construction and Operation

Data from Other Area Monitoring Wells



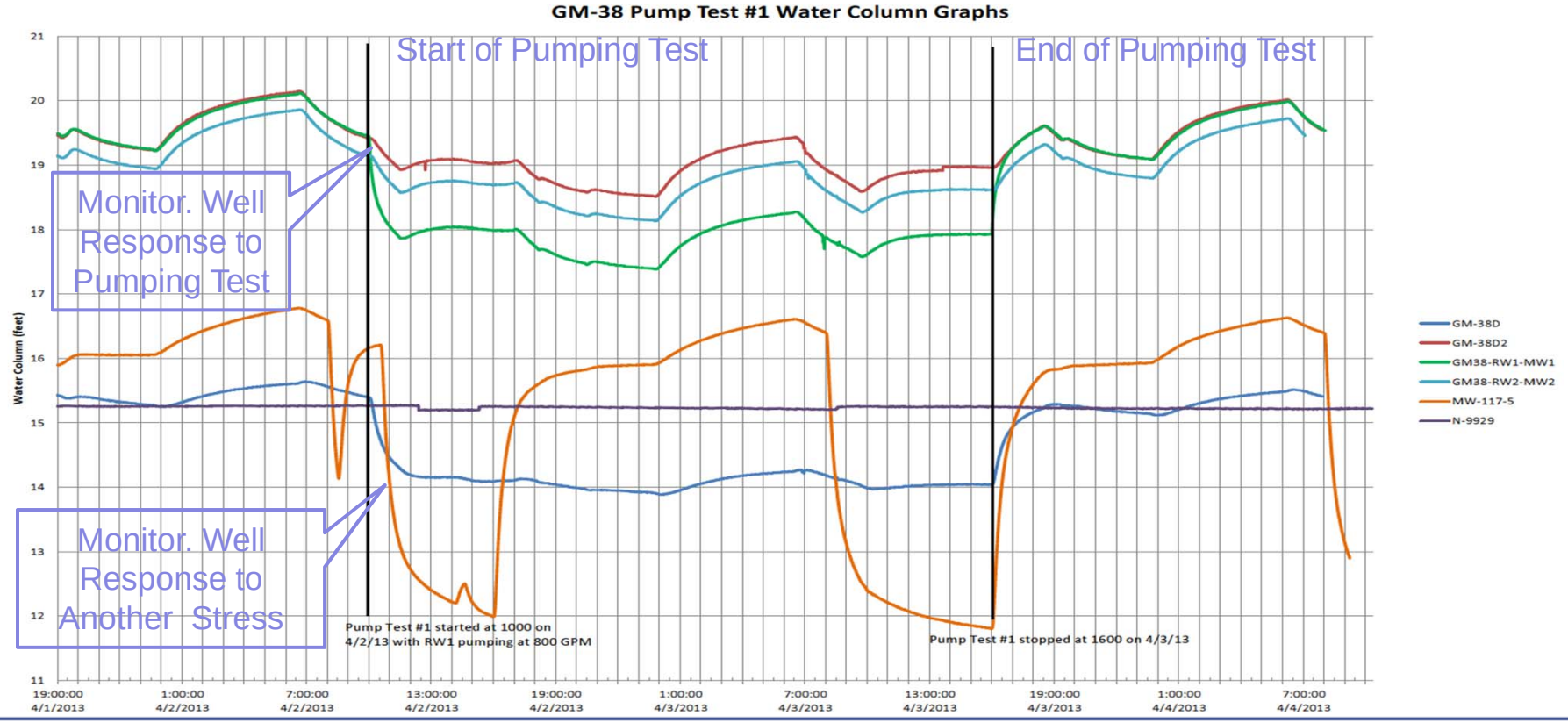
Capture Zone Analysis

- Conducted four pumping tests at the GM-38 Area in April 2013
  - –RW-01
  - –RW-03
  - –RW-01 and -03
  - –BWD Plant 4
- Monitored 18 wells with screen depths of 50 to 757 feet below ground surface
- Water levels were recorded over a two-week period
- Also, a year-long area-wide evaluation is ongoing



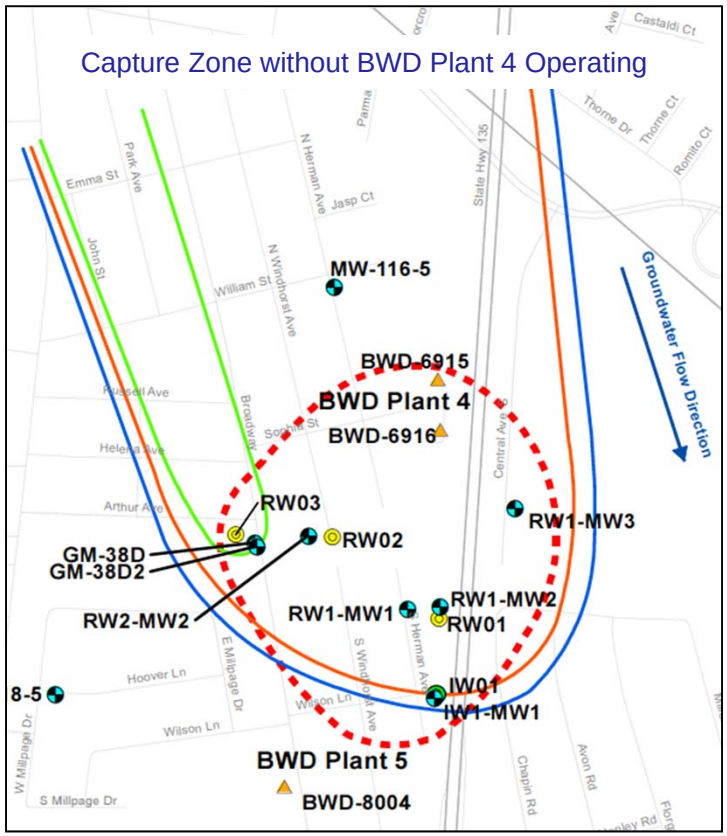
Capture Zone Analysis

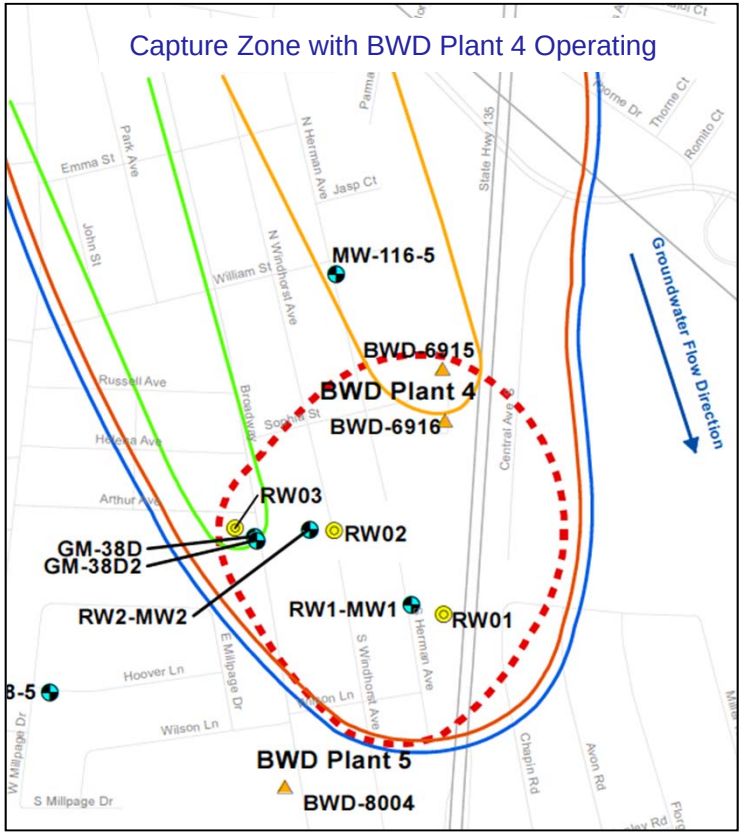
- Example of Water Level Readings
- RW01 running at 800 gallons per minute
- Note response of some wells to pumping test and that some wells to other area pumping stress



Capture Zone Analysis

- Evaluation indicates 95 to 100 percent capture of GM-38 Hotspot
- Southwest piece of hotspot and capture zone (Without BWP Plant 4 Operating) is within range of accuracy of hotspot delineation and capture calculations





Shutdown Evaluation

- Shutdown Evaluation is in progress, previous discussion is provided in the GM-38 Conceptual Design Report (October 2002):
  - "These wells (GM-38 Extraction Wells) will need to operate for a period of approximately 5 to 10 years to reduce the concentration of TVOCs in groundwater to an average of 100 µg/l in the GM-38 Area.
  - This final concentration will result in the removal of approximately 90% of the TVOC contamination in the area and residual TVOC concentrations in GM-38 Area groundwater will then be similar to the balance of the OU 2 ROD groundwater."
- Report is due in December 2013

Restoration Advisory Board (RAB) Meeting

OU2 - Offsite Groundwater Investigation Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage

11/06/2013

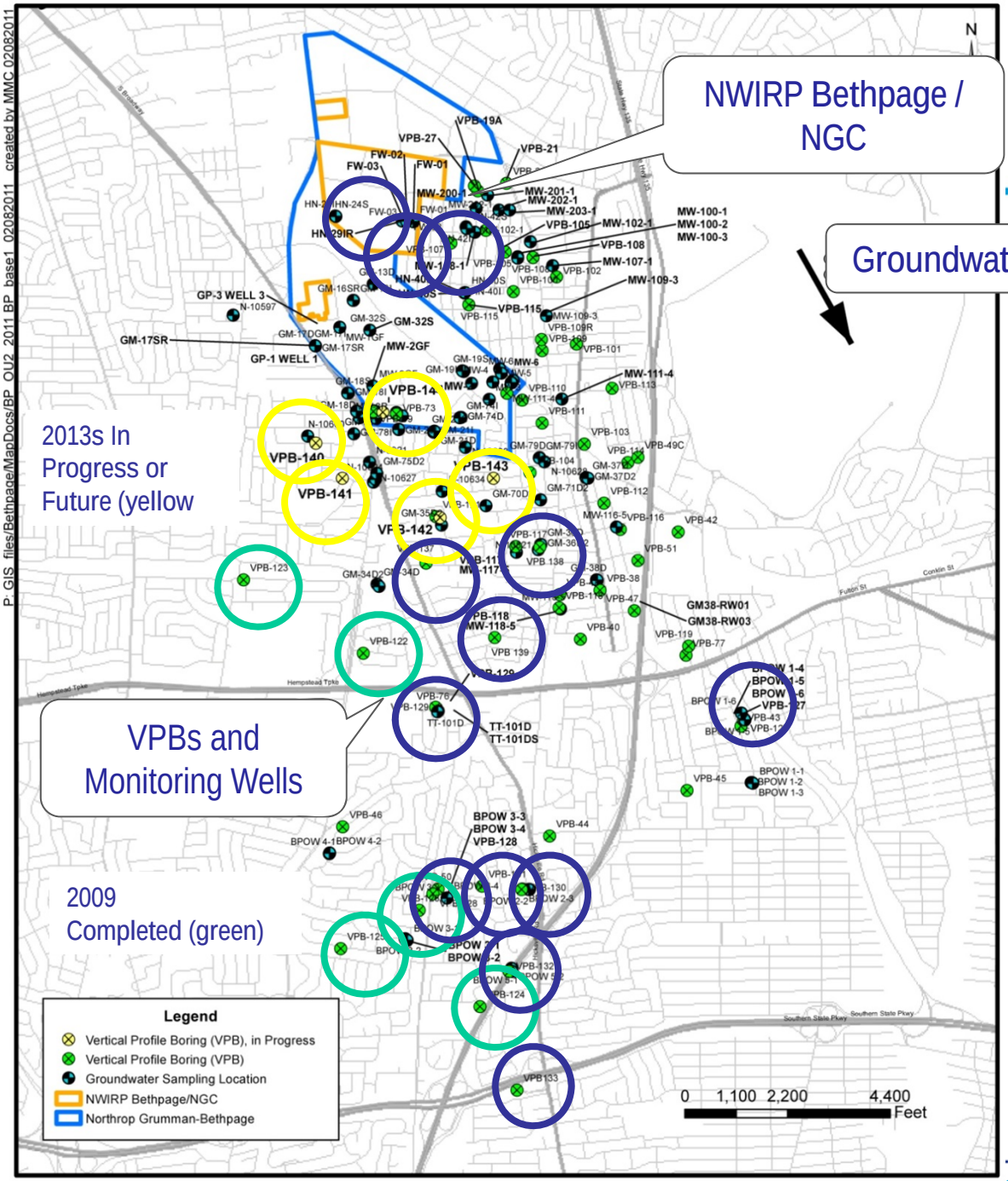
OU2 GROUNDWATER INVESTIGATION - PURPOSE

- 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 (May 2013)

-Installation of Vertical Profile Borings 139 and 142

-Installation of three associated wells at VPB 138 and 2 wells at VPB 139

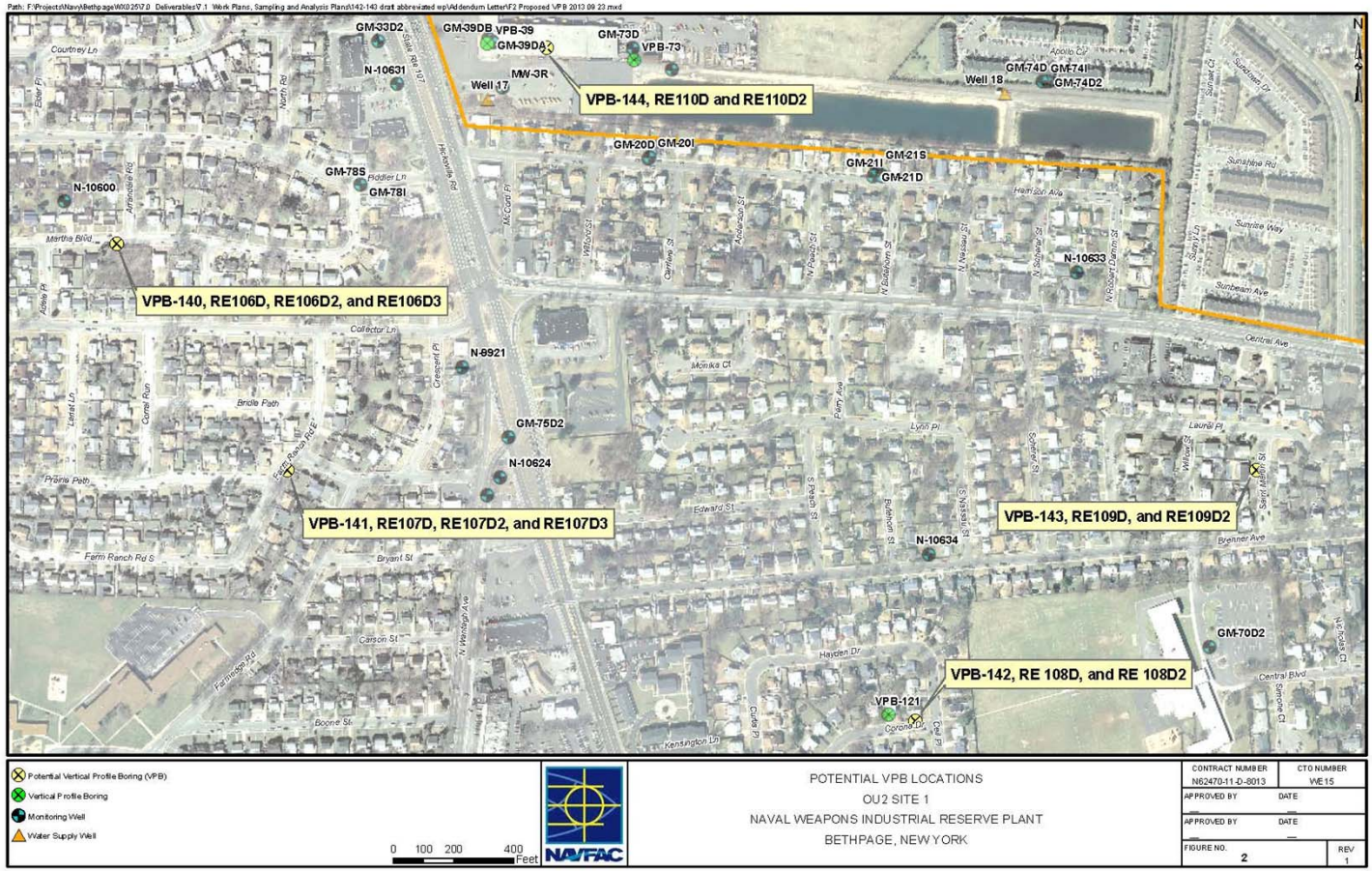
-Two associated wells at VPB 142 currently being installed

- Future work:

-VPB's 140, 141, and 144 and associated well installations scheduled to start late December 2013; additional borings/wells contingent on findings

-Groundwater sampling of VPBs 137, 138, and 139 to be performed in October – November 2013; associated Data Summary to be prepared by January 2014.

OU2 – CURRENT AND FUTURE VPB's AND MONITORING WELLS



OU2 ACTIVITIES

Questions?