NAVFAC
Naval Facilities Engineering Command
NAVFAC MID-ATLANTIC

Site 1 – Former Drum Marshalling Area PCB Investigation

UFP-SAP/Project Scoping Meeting

Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage
November 10, 2009

Why are we here?

Reasons:

- Navy plans on refining Conceptual Site Model (CSM) at Site 1- Former Drum Marshalling Area
  - depth of PCBs in source area soils
  - determine whether PCBs are migrating in groundwater

Meeting Outline:

- Introduction to UFP-SAP process
- Site history
- Present preliminary scope of work, this is a working draft

What is a UFP-SAP?

GENERAL:

- Uniform Federal Policy – Sampling and Analysis Plan (UFP-SAP)
- New standard format for sampling plans, established October 1, 2007, signed policy on December 7, 2007
- Required for DoD sampling plans generated after October 1, 2008
- Implements a team based approach to planning and encourages states to accept UFP-SAP
- Designed to encourage a level of detail consistent with the scope and complexity of a project.
- In addition to Data Quality Objectives (DQO's), UFP-SAP captures and documents:
  - Clearly defined project goals and objectives
  - Framed by a Conceptual Site Model (CSM)
  - Schedules
  - Resources

UFP-SAP Components

SYSTEMATIC PLANNING

- Required and documented
- Includes all relevant/available stakeholders and gathers their input early in the planning stage

DATA QUALITY OBJECTIVES

- Define problem (Step 1)
- State decisions (Step 2)
- Identify decision inputs (Step 3)
- Establish temporal/spatial boundaries (Step 4)
- Explicitly state data use (Step 5)
- Establish decision and data quality (Step 6)
- Generate defensible sampling design (Step 7)

BENEFITS:

- Improves data quality
- Clearly defined analytical parameters
- Establishes validation requirements
- Encourages consistency and common understanding
- Improves efficiencies
- Eliminates/reduces rework
- Uses the team-based concept
- Assures defensible decisions

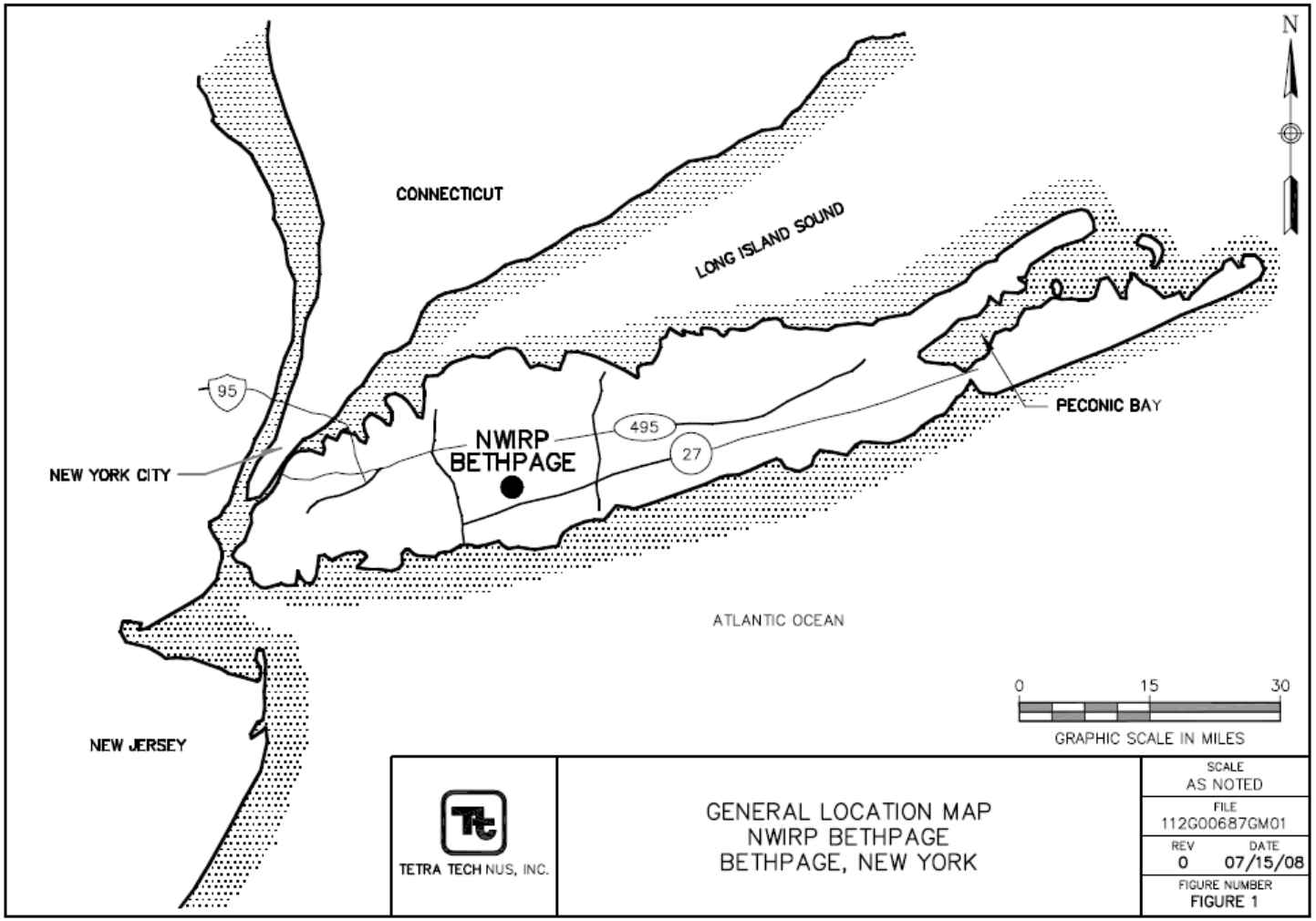
UFP-SAP Components (cont.)

Workbook (contains 37 worksheets)

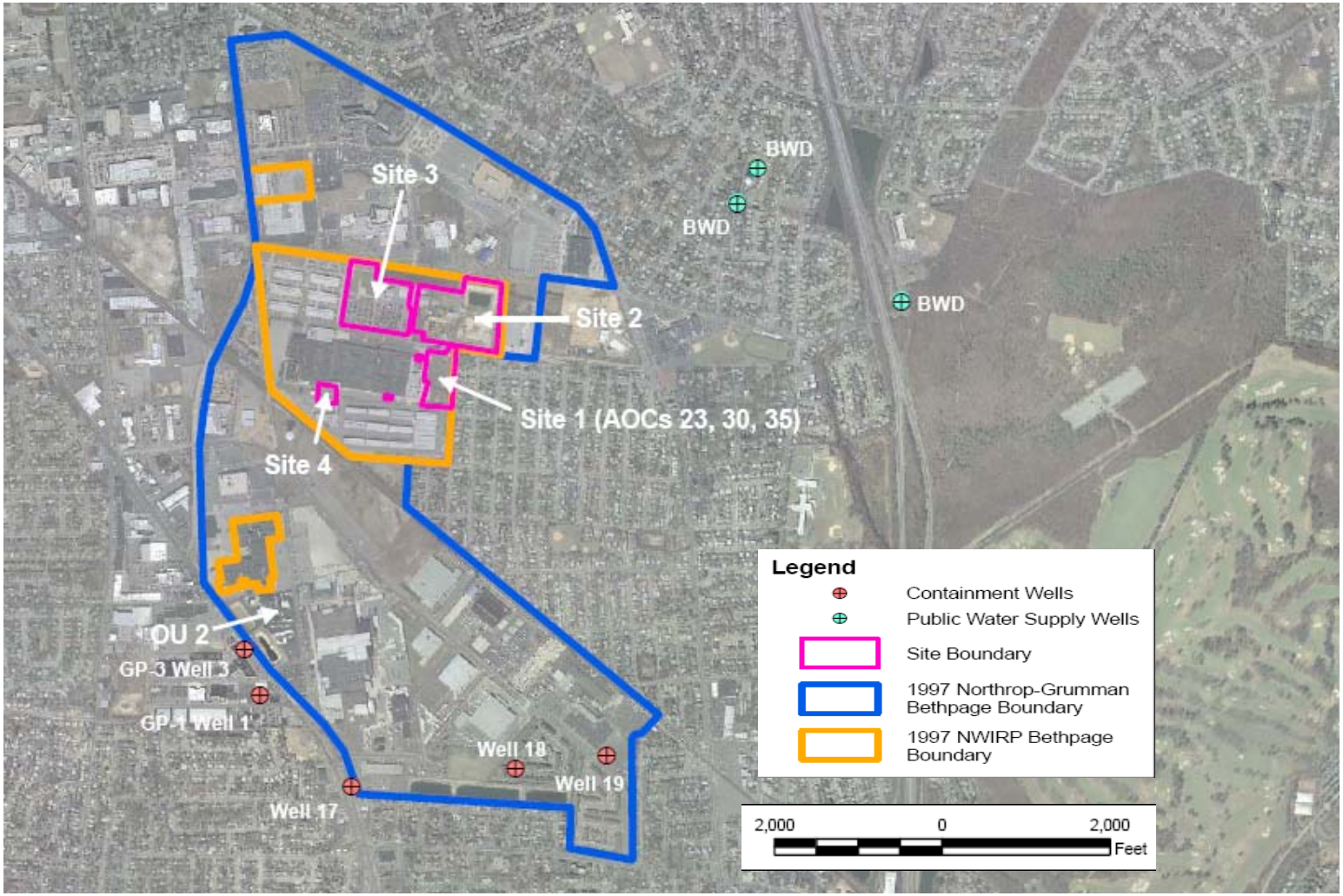
1. Title/approval – key stakeholders
2. SAP identifying information (cross-walk and worksheet omission rationales)
3. Distribution list
4. Personnel sign-off – all SAP implementers
9. Scoping session participants
10. DQO Step 1 (conceptual site model and problem statement)
11. DQO Steps 2 – 7 (decision statements through sampling strategy)
12. Field QC performance
13. Secondary data criteria and Limitations Table
14. Summary of project tasks
15. Reference limits and evaluation
17. Sampling design and rationale
22. Field equipment calibration/maintenance
28. Laboratory QC performance
29. Project documents and records
32. Assessments and corrective actions

34-37: Data verification, validation, and usability assessment

Location Map



Facility Map



Site 1 – Historical Summary

History:

- **1950's through the early 1980's** - the site was used for staging waste solvents, liquid plating wastes (metals), and autoclave (PCB fluid) wastes.
- **1986** - IAS was conducted at Site 1
- **May 1992** - Phase 1 RI conducted
- **October 1993** - Phase 2 RI conducted, adequately delineated the horizontal extent of soil contamination
- **July 1993** - Interim Remedial Measure, a soil cover was placed over the limits of Site 1 to eliminate risk associated with fugitive dust and dermal contact.
- **March 1994** - Feasibility Study (FS) was conducted
- **October 1994** - Proposed Remedial Action Plan (PRAP)
- **May 1995** - Site 1 ROD was issued, known PCB contamination down to 7 feet bgs.
- **1995 –** Pre-Remedial Design Investigations (1 and 2) - Investigations concluded

  - PCB-contaminated soils present below 7 feet bgs, VOC-contaminated soil was bounded, PCB-contaminated soil was determined to be present below 50 feet bgs.
- **1998 – 2002** – AS/SVE system installed and operated to address VOC contaminated soil
- **1998** – AOC and SWMU Investigation at NWIRP Bethpage

Site 1 – Historical Summary

History (cont.):

- **1998** – AOC and SWMU Investigation at NWIRP Bethpage
  - Dry Wells 20-08 and 34-07 were remediated to a depth of approximately 30 feet bgs.
- **2000** – Additional delineation of PCB contamination at Dry Wells 20-08 and 34-07
  - PCB contamination was found to be at a depth of approximately 60 feet bgs.
- **2002** - Pre-Remedial Design Investigation #3
  - Conducted to evaluate AS/SVE effectiveness on VOC removal in soils and better determine extent of PCB and metals contaminated soils
  - PCB contamination was determined to be present below 60 feet bgs.
- **2003-2007** – Navy conducts a series of internal evaluations of cost and potential alternative remedies for addressing PCB and metal contamination at Site 1
- **2005-2007** – Soil Vapor Concerns, NYS identifies residual VOC-containing soil vapor and potential migration off site.
- **January 2008** – Soil Vapor Investigation at Site 1 boundary
- **October 2008** – Off Site Soil Vapor Investigation
- **January 2009 – present** - Indoor air sampling, APU and SSD Installation, and continued monitoring in residential neighborhood

Site 1 – What We Know

- Vertical extent of PCBs in soil is below groundwater table
- Volume of PCB contaminated soil concentrations greater than 1 milligrams per kilogram (mg/kg) exceeds 38,000 cubic yards
- Groundwater at the site is approximately 52 feet below ground surface
- PCBs near the water table at >1,000 (mg/kg) (100 to 1,000 times potential cleanup goals of: 1, 3.2, 25, 50 (mg/kg)
- PCBs detected in downgradient monitoring wells ranging from 0.27 J to 1.4 µg/L

Site 1 – Problem Definition and Study Questions

Problem Statements (DQO Step 1):

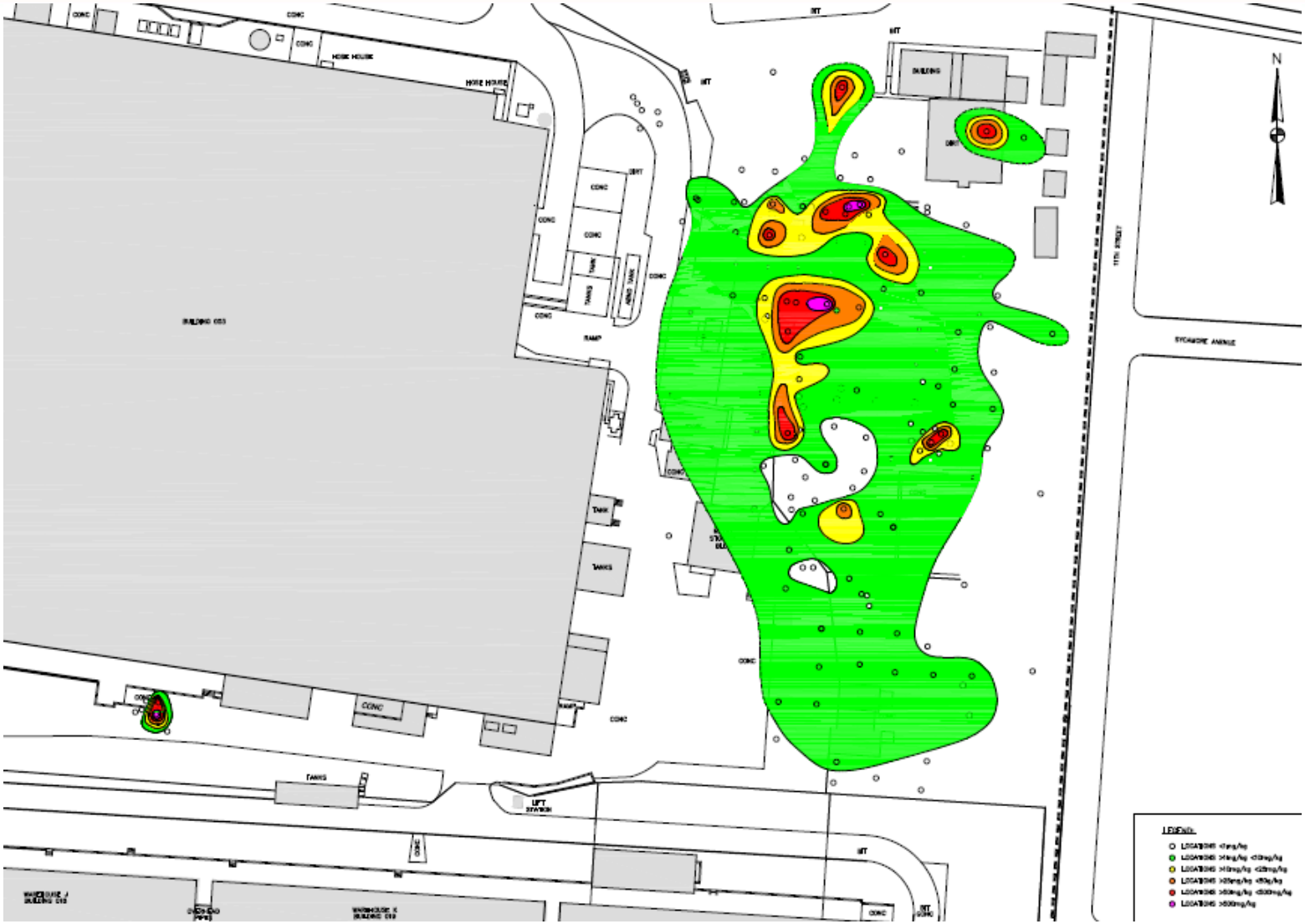
- The release of PCBs at Site 1 have impacted Site soils and potentially impacted Site groundwater
- Conceptual Site Model presented in slides 13 - 22

Study Questions (DQO Step 2):

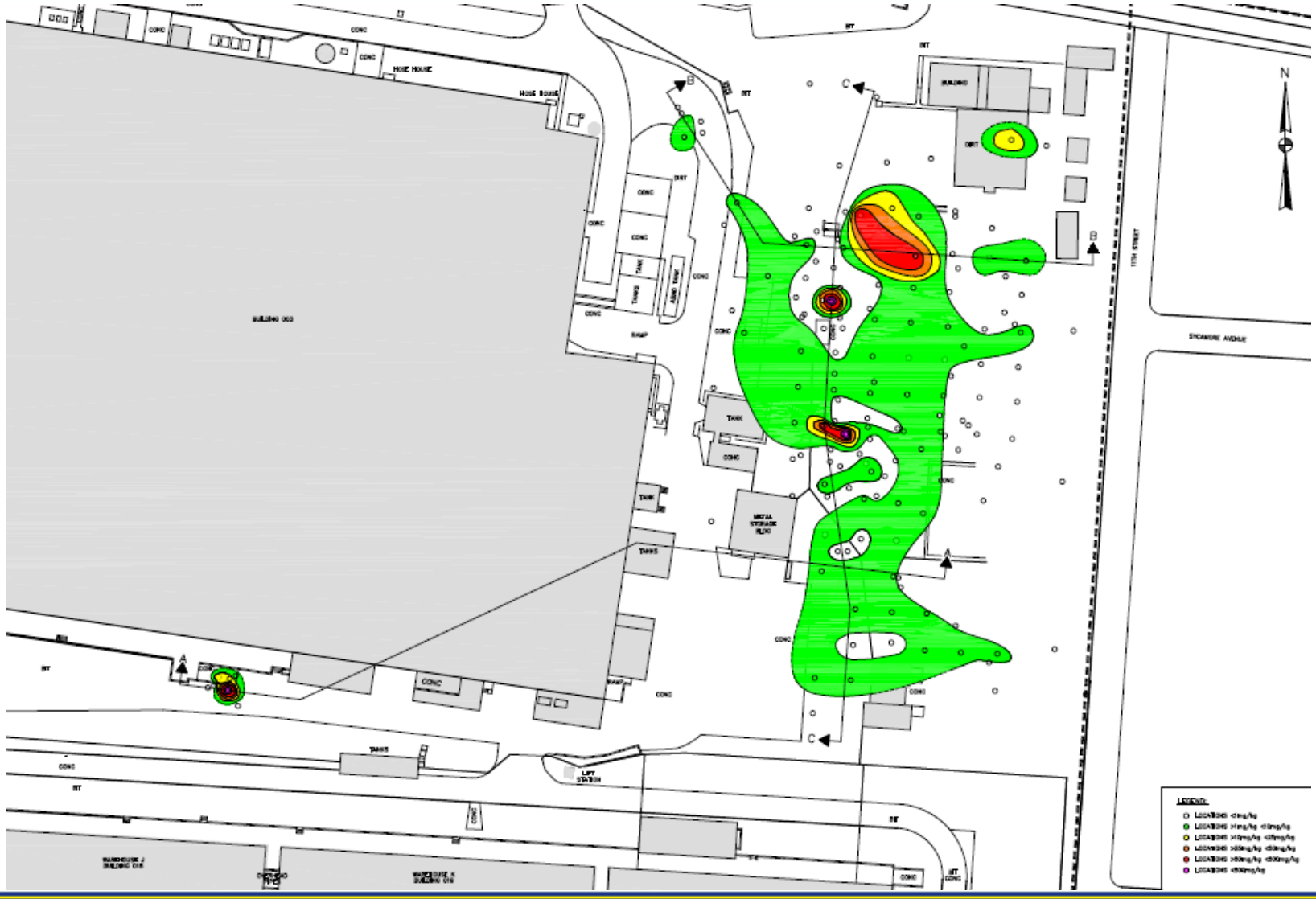
- What is the vertical extent of PCB-contaminated soils in the source area?
- Have PCBs impacted groundwater beyond the site boundary? If so, what is the vertical and horizontal extent of PCBs in groundwater?
- Are VOCs present in deeper site groundwater that could promote PCB migration?

SITE 1 – PCB CONCENTRATIONS (0-2 FT BGS)

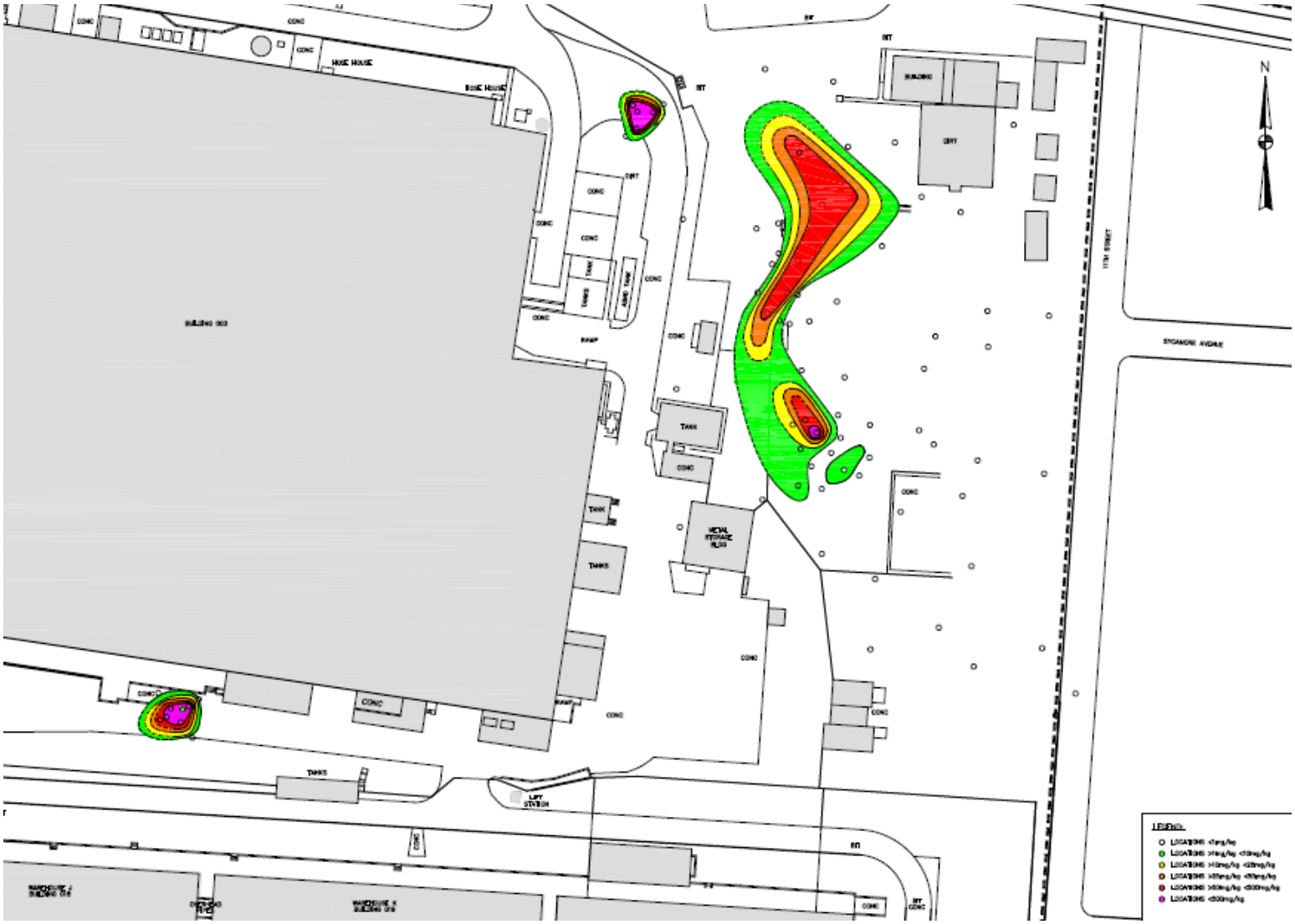
SITE 1 – PCB CONCENTRATIONS (2-15 FT BGS)



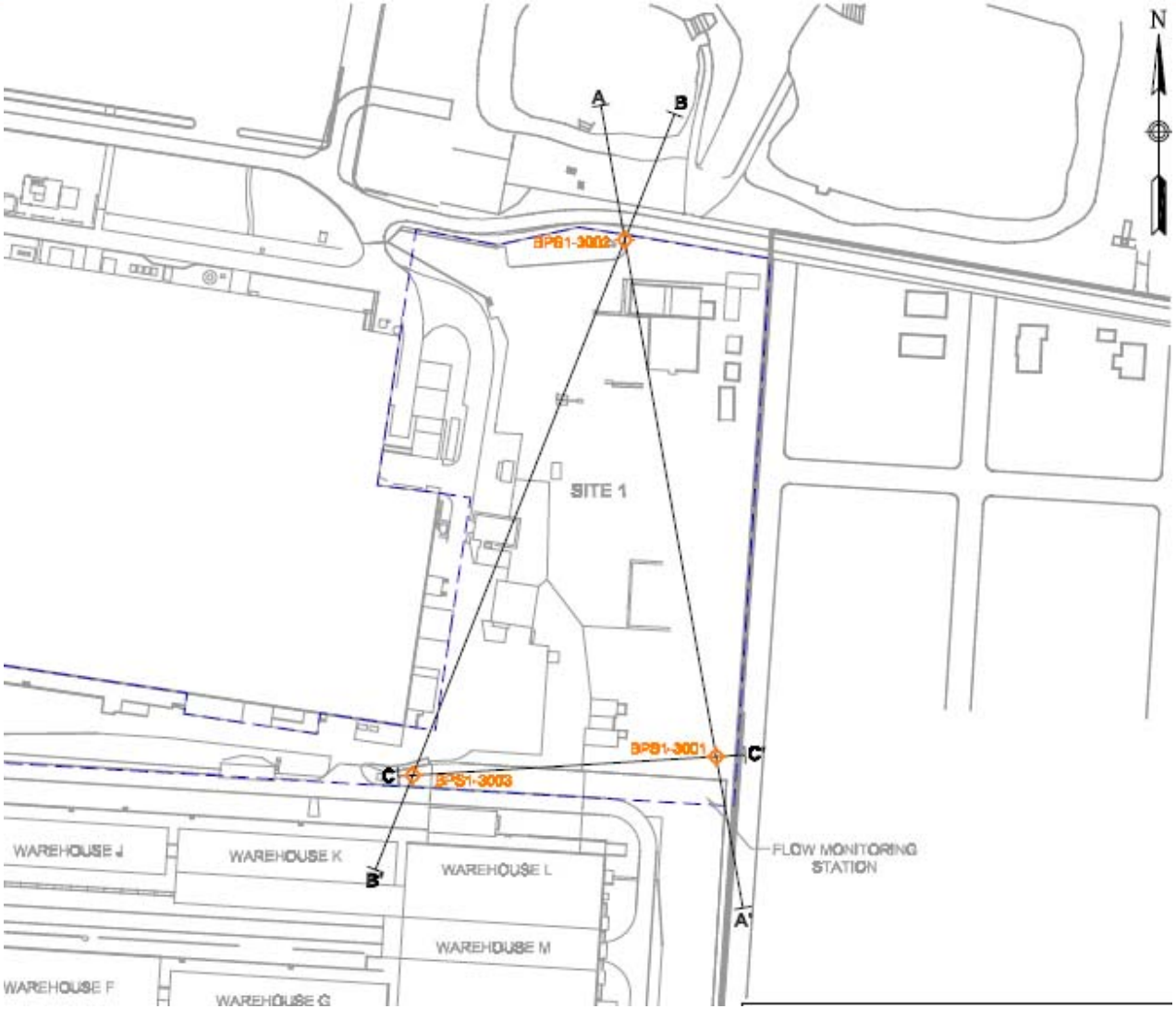
SITE 1 – PCB CONCENTRATIONS (15-25 FT BGS)



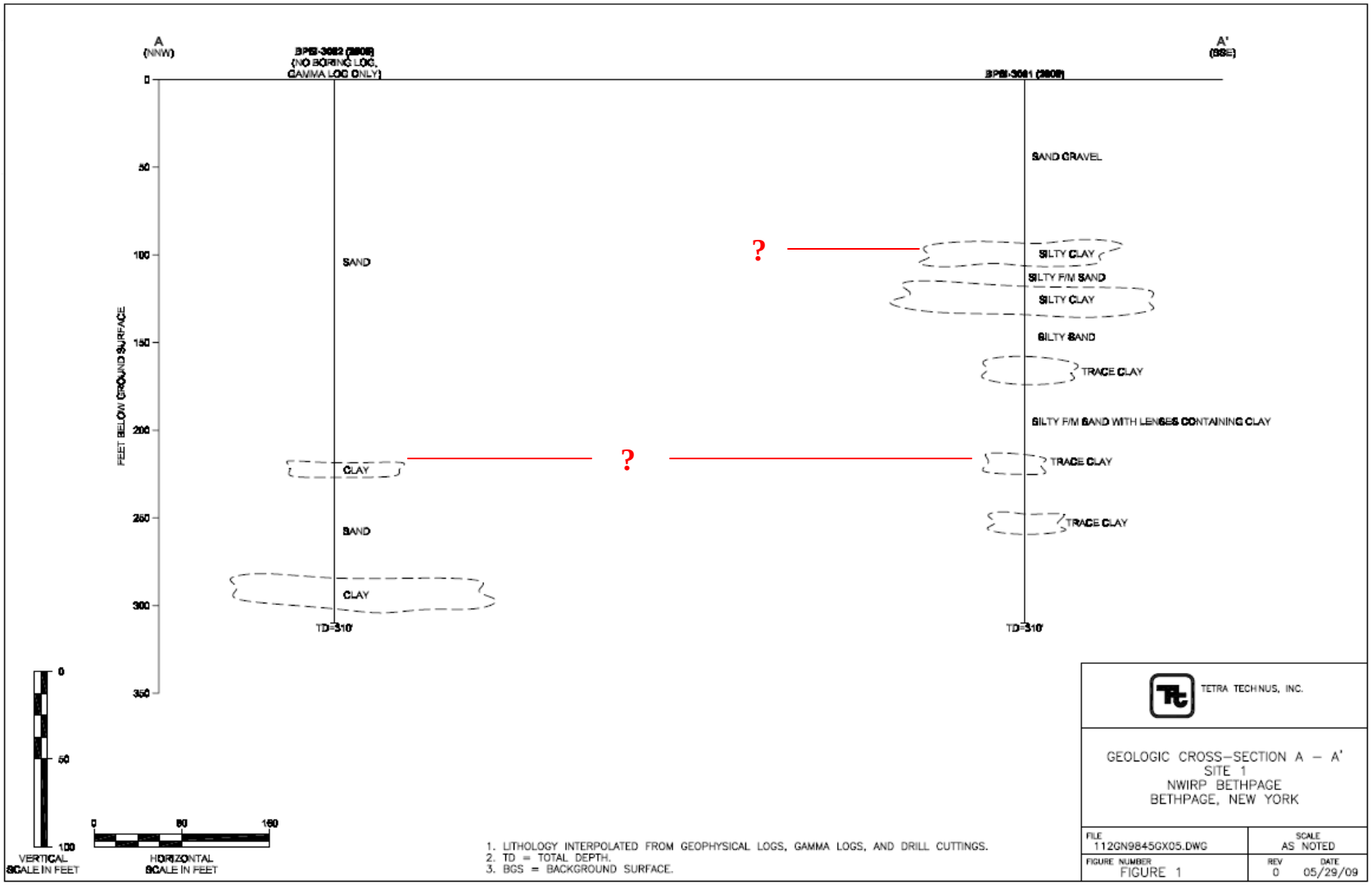
SITE 1 – PCB CONCENTRATIONS (>25 FT BGS)



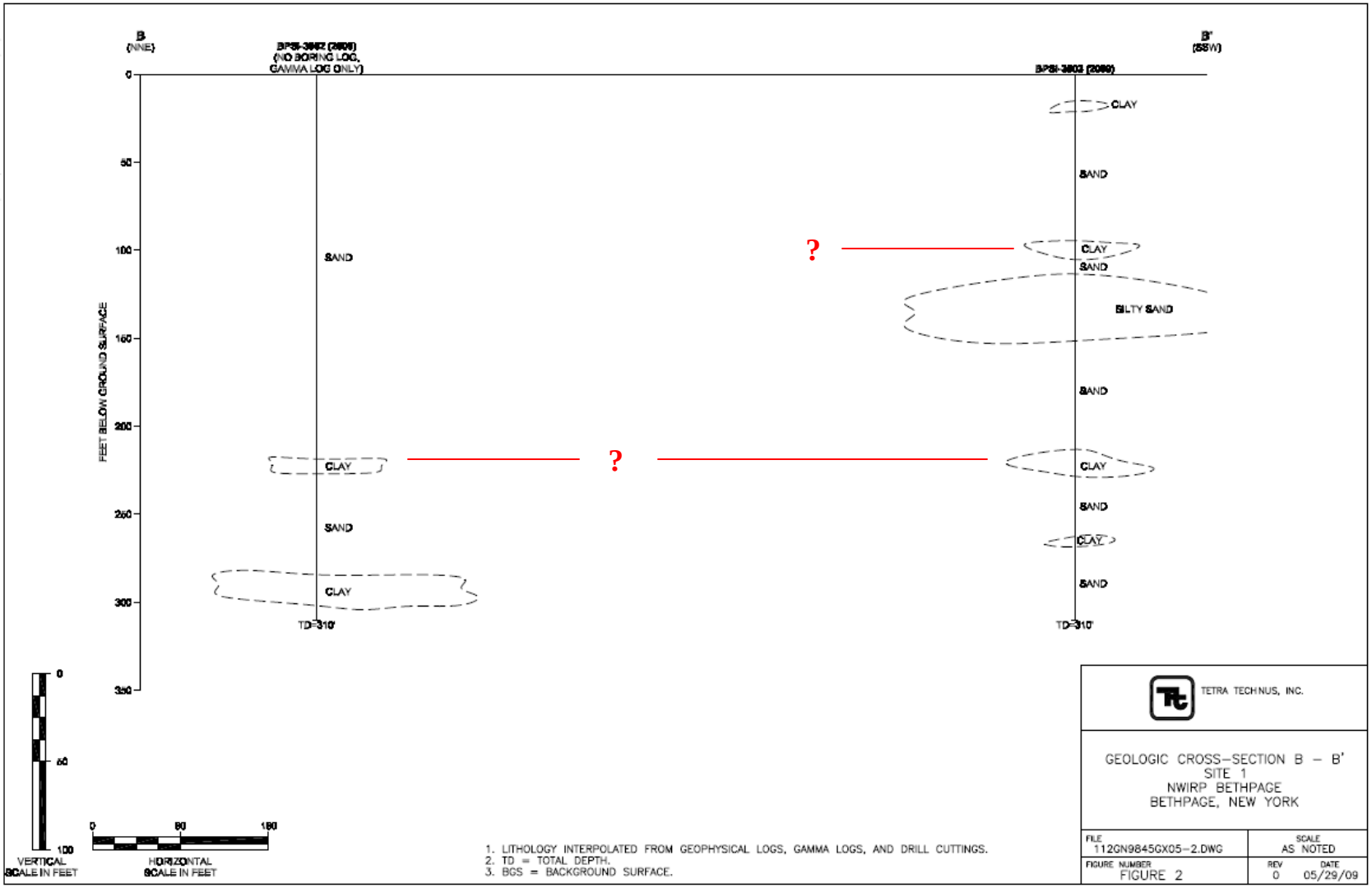
SITE 1 – BORING AND CROSS SECTION LOCATIONS (MAY 2009)



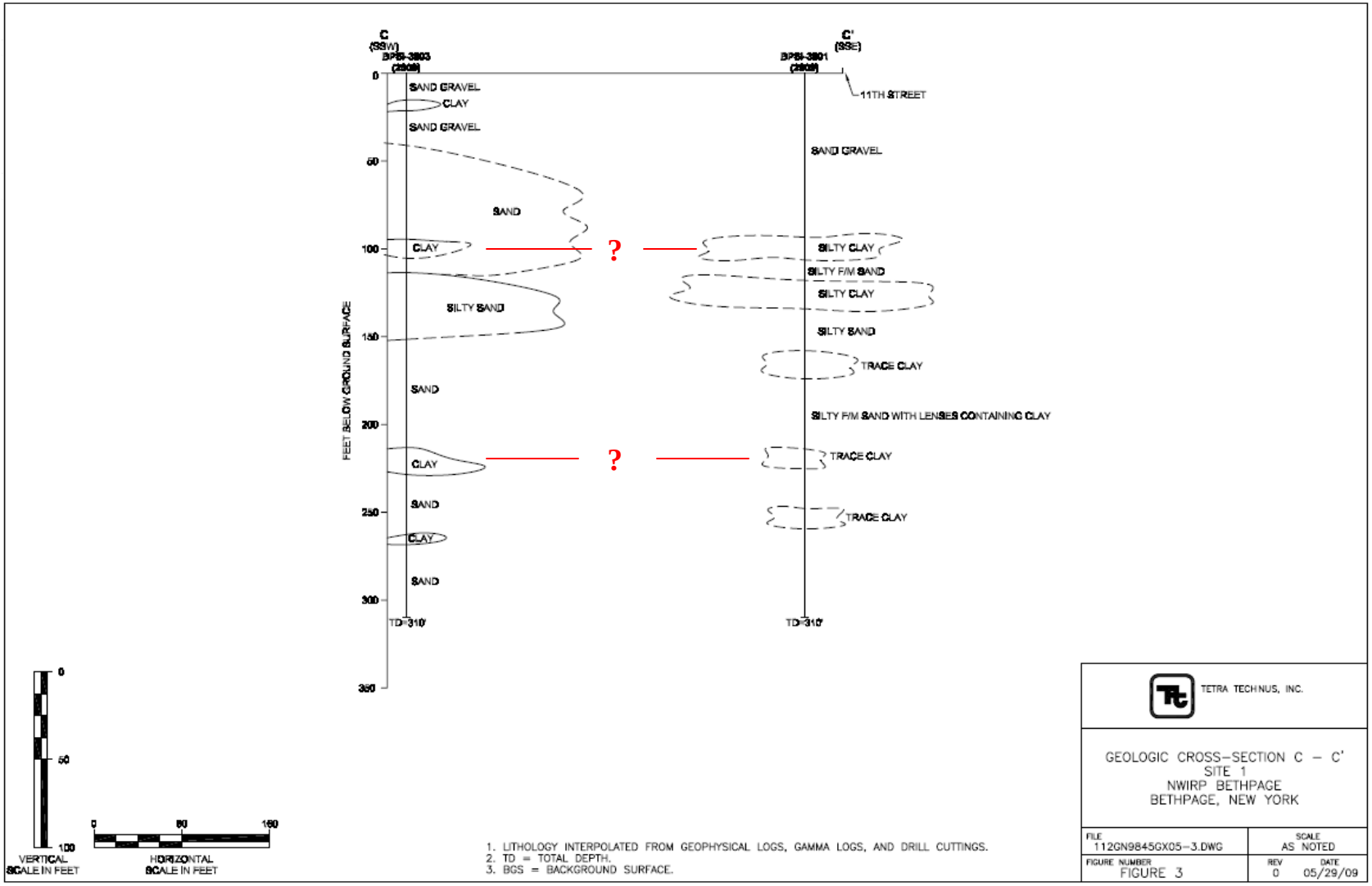
SITE 1 – CROSS SECTION A – A' (MAY 2009)



SITE 1 – CROSS SECTION B – B' (MAY 2009)



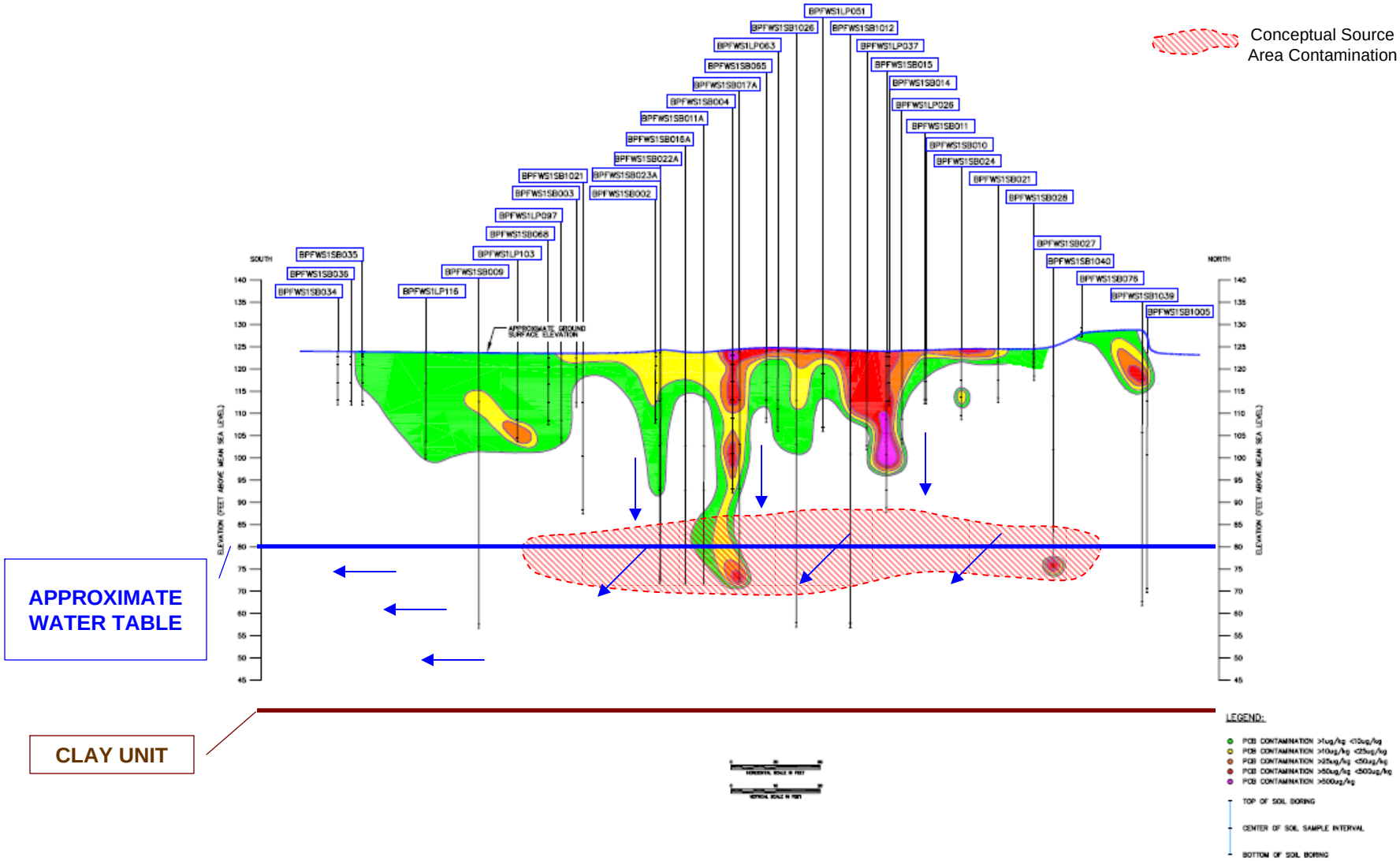
SITE 1 – CROSS SECTION C – C' (MAY 2009)



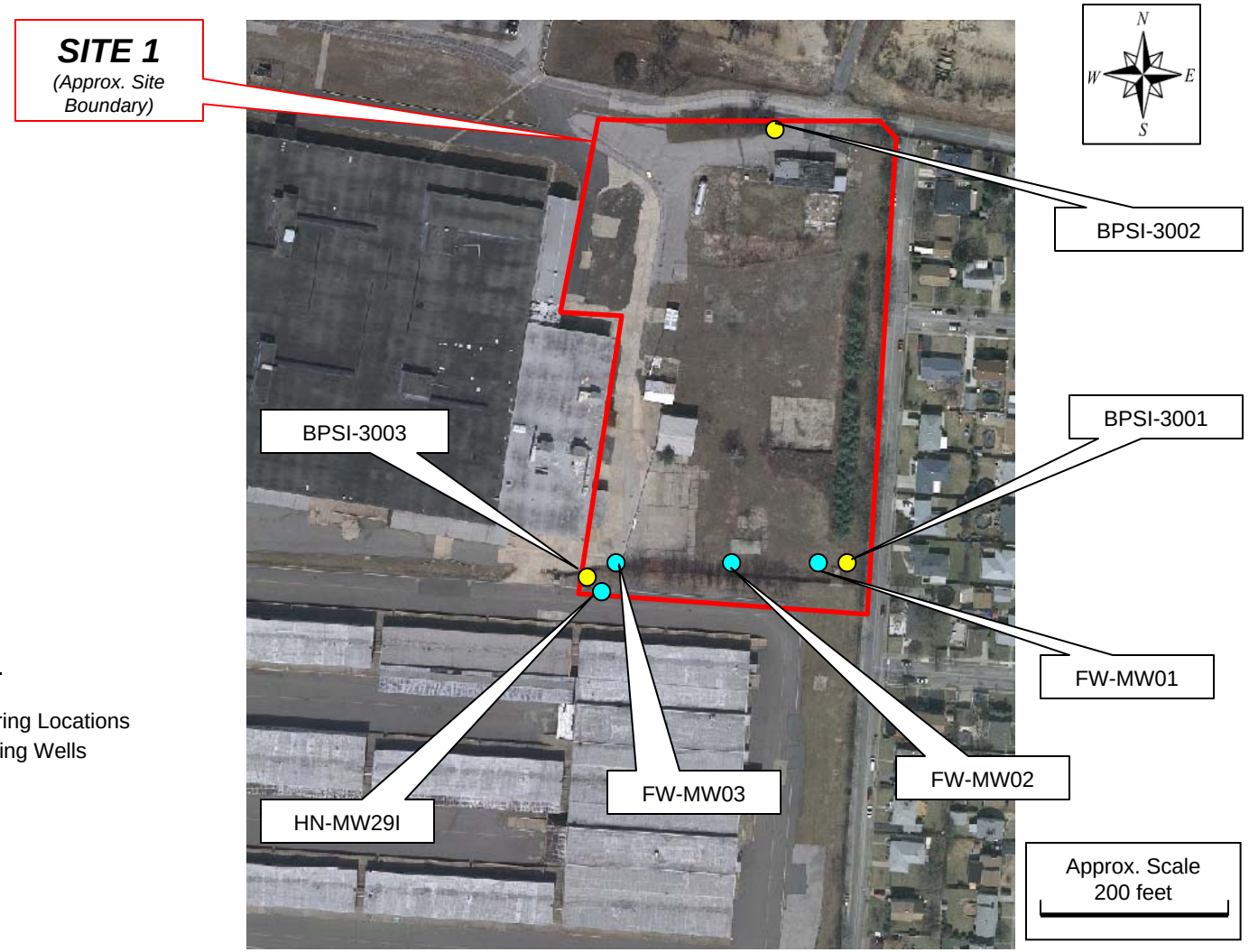
Site 1 – Conceptual Site Model (CSM)

- The extent of PCB-contaminated soils well defined from 0 to 25 feet below ground surface (bgs)
- The extent of PCB-contaminated soils below 25 feet is not well defined horizontally or vertically
- Lithologic data suggests clay units are present at approximately 100 feet bgs and 220 feet bgs
    - Unknown if continuous below source area
- Trace detections of PCBs in site groundwater
    - May be present due to well installation technique.

SITE 1 – CSM (Cross Section, North/South)



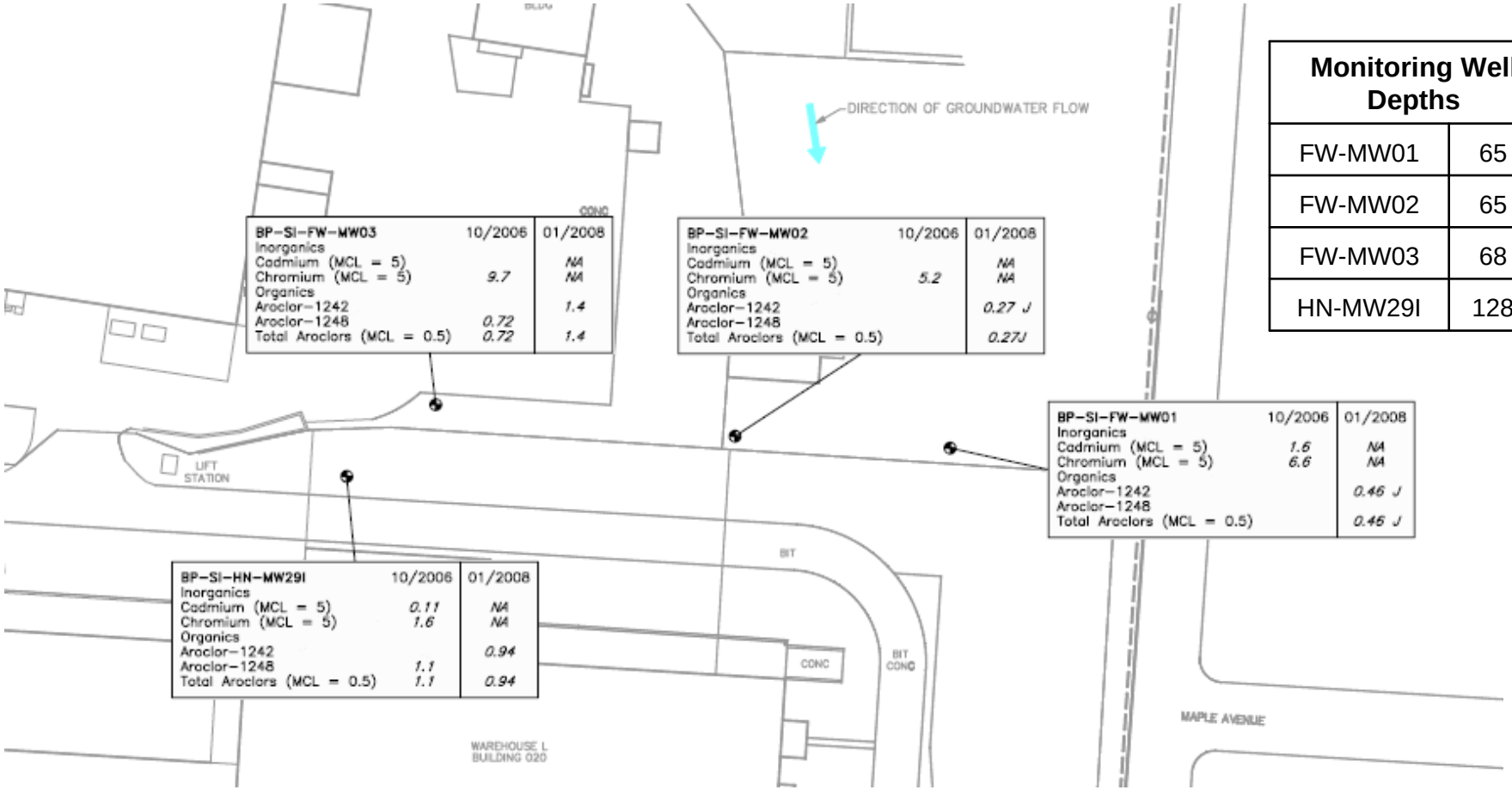
SITE 1 – EXISTING MONITORING WELLS AND BORING LOCATIONS (MAY 2009)



Legend:

- Existing Soil Boring Locations
- Existing Monitoring Wells

SITE 1 – JANUARY 2008 GROUNDWATER RESULTS



Monitoring Well Depths	
FW-MW01	65 ft
FW-MW02	65 ft
FW-MW03	68 ft
HN-MW29I	128 ft

Site 1 – Inputs to the Decision (DQO Step 3)

Inputs to the Decision:

- Nine soil borings via Rotosonic drilling methods
  - Six in the source area
  - Three downgradient locations
- Soil borings to approximately 250 feet bgs
- Soil PCB analysis via onsite field test kits
- Confirmatory sampling via fixed based laboratory
- Groundwater grab samples for laboratory analysis (PCBs and VOCs)
  - Placement of permanent monitoring wells
- Well installation (4 well clusters) to monitor potential migration of PCBs and VOCs in groundwater, approximate three depths at each cluster

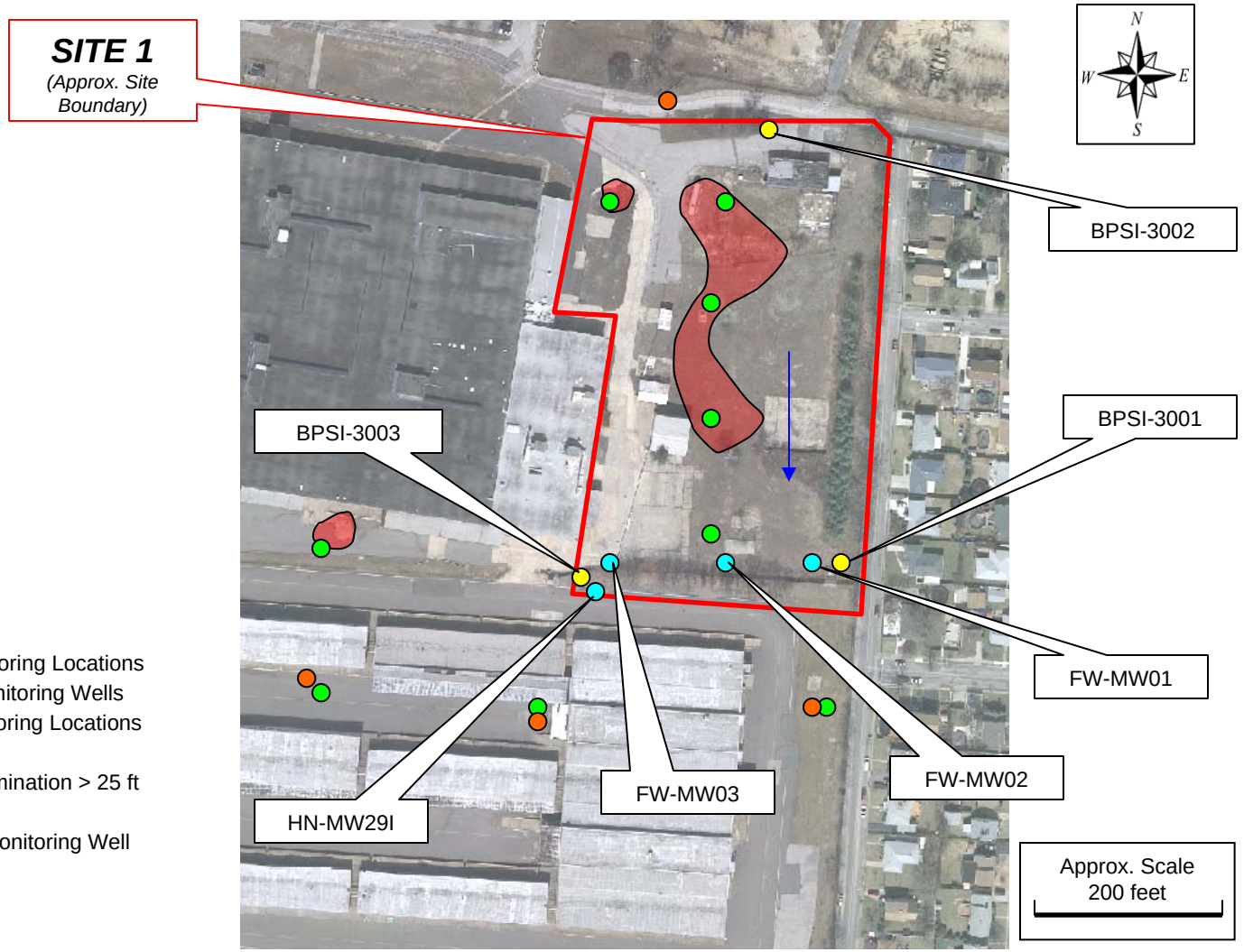
  Well depths determined based on lithology and PCB results
  - One up gradient well cluster
  - Three down gradient well clusters

Site 1 – Inputs to the Decision (DQO Step 3)

Project Action Levels and Detection Limits:

- Soil: NYSDEC Part 375 Soil Screening value = 1 mg/kg (SW 846 8082, 0.33 mg/kg)
- Water: NYSDOH MCLs = 0.50 µg/L in groundwater (8260B, 8082, 0.5 µg/L)

SITE 1 – PROPOSED MONITORING WELLS AND BORING LOCATIONS (DQO Step 4)



Legend:

- May 2009 Boring Locations
- Existing Monitoring Wells
- Proposed Boring Locations
- PCB Contamination > 25 ft
- Proposed Monitoring Well

PCB Investigation – Sampling Approach

First Field Event (Six source area borings and three downgradient borings):

- PCB field test kit sampling (nine borings)
  - Discrete samples (5 foot intervals [25 feet to 120 feet bgs]
  - Composite samples (10 foot intervals [120 to 250 feet bgs])
  - Screen soils and determine collection of fixed-based lab samples
- PCB laboratory confirmatory samples
  - Based on test kit data to confirm and establish vertical extent of PCBs
  - Six samples per boring
- Groundwater grab sampling
  - Determine presence of PCBs and VOCs in groundwater downgradient of existing wells
  - Aid in determining well placement
  - Three per boring

PCB Investigation – Sampling Approach

Second Field Event (Monitoring Well Installation and Sampling):

- Four well clusters, anticipated three wells at each cluster, screen depths based on soil boring field event
- Conduct round of groundwater sampling (existing and new monitoring wells)

PCB Investigation – Decision Rules (DQO Step 5)

Soil Borings:

- PCB test kit samples

  > 1mg/kg = collection of additional samples at depth

  < 1mg/kg = confirm with two consecutive non detections

- PCB laboratory confirmatory samples

  - Collected based on field test kit data

  - Samples analyzed from depths with test kit PCB results < 1 mg/kg and >1ppm

- Groundwater grab sampling (filtered and unfiltered) to determine presence of PCBs in groundwater downgradient of source area for well installation locations

  - If PCBs detected > 0.50 µg/L, monitoring well cluster will be placed further downgradient

  - If PCBs are < 0.50 µg/L, monitoring well cluster will be placed near soil boring

PCB Investigation – Decision Errors (DQO Step 6)

- PCB field test kit samples, uncertainty due to matrix interferences
  - False Positive > 1ppm, may lead to vertical extent of PCBs deeper then actual
  - False Negative < 1ppm, may not determine vertical extent of PCBs > 1ppm
  - Laboratory samples will be used to confirm field test results, may require additional soil investigations

PCB Investigation – Decision Errors (DQO Step 6)

- Laboratory soil data to be validated
  - False Positive > 1ppm, may lead to vertical extent of PCBs deeper then actual
  - False Negative < 1ppm, may not determine vertical extent of PCBs > 1ppm may require additional soil investigations

PCB Investigation – Decision Errors (DQO Step 6)

- Groundwater grab samples
  - Sample turbidity and collection method add to uncertainty
  - False Positive > 0.50 µg/L, install well cluster further downgradient
  - False Negative < 0.50 µg/L, may install well cluster at same location
  - Permanent monitoring well data will be used to confirm

PCB Investigation – Decision Errors (DQO Step 6)

- Monitoring well groundwater samples
  - Data to be validated
  - False Positive > 0.50 µg/L, install well cluster further downgradient
  - False Negative < 0.50 µg/L, may install well cluster at same location
  - Multiple rounds of samples will be collected to confirm data

PCB Investigation – Design Optimization (DQO Step 7)

- Optimization of sampling plan with NYSDEC consensus
  - Agreed upon goals and objectives
  - Scope finalization

- Questions, open discussion, consensus