PENINSULA BOULEVARD GROUNDWATER PLUME SUPERFUND SITE OPERABLE UNIT 2

REMEDIAL INVESTIGATION FEASIBILITY STUDY PROPOSED PLAN

PUBLIC MEETING

6/22/2017

Thursday, June 22, 2017

MEETING PARTICIPANTS

- ***Gloria M. Sosa – EPA Project Manager***
- ***Cecilia Echols – EPA Community Involvement Coordinator***
- ***Pete Mannino – EPA WNYRS Chief***
- ***Nick Mazziotta – EPA Risk Assessor***
- ***Margo Ludmer – EPA Region 2 attorney***
- ***Melissa Sweet – NYSDEC Project Manager***
- ***John Swartwout – NYSDEC Section Chief***

Peninsula Boulevard Groundwater Plume Superfund Site Operable Unit 2 Public Meeting

- *To discuss the Proposed Plan for the cleanup of the Peninsula Boulevard Groundwater Plume Superfund Site, OU 2 – Source Delineation*
- *EPA will accept public comments until Monday, July 17, 2017.*
- *EPA will assess public comments in its Record of Decision Responsiveness Summary.*

Superfund Remedial Process

- *Site Discovery and Hazard Ranking System (HRS)*
- *Preliminary Assessment/Site Inspection (PA/SI)*
- *Site Placed on National Priorities List (NPL)*
- *Remedial Investigation/Feasibility Study (RI/FS)*
- *Proposed Remedy*
- *Record of Decision (ROD)*
- *Remedial Design/Remedial Action (RD/RA)*
- *Site Deletion from NPL*

Site Background

- EPA listed the Peninsula Boulevard Site on NPL in 2004.
- EPA conducted a remedial investigation at the Site from 2005 to 2010 to determine the nature and extent of the contamination, and to identify potential threats to human health and the environment.

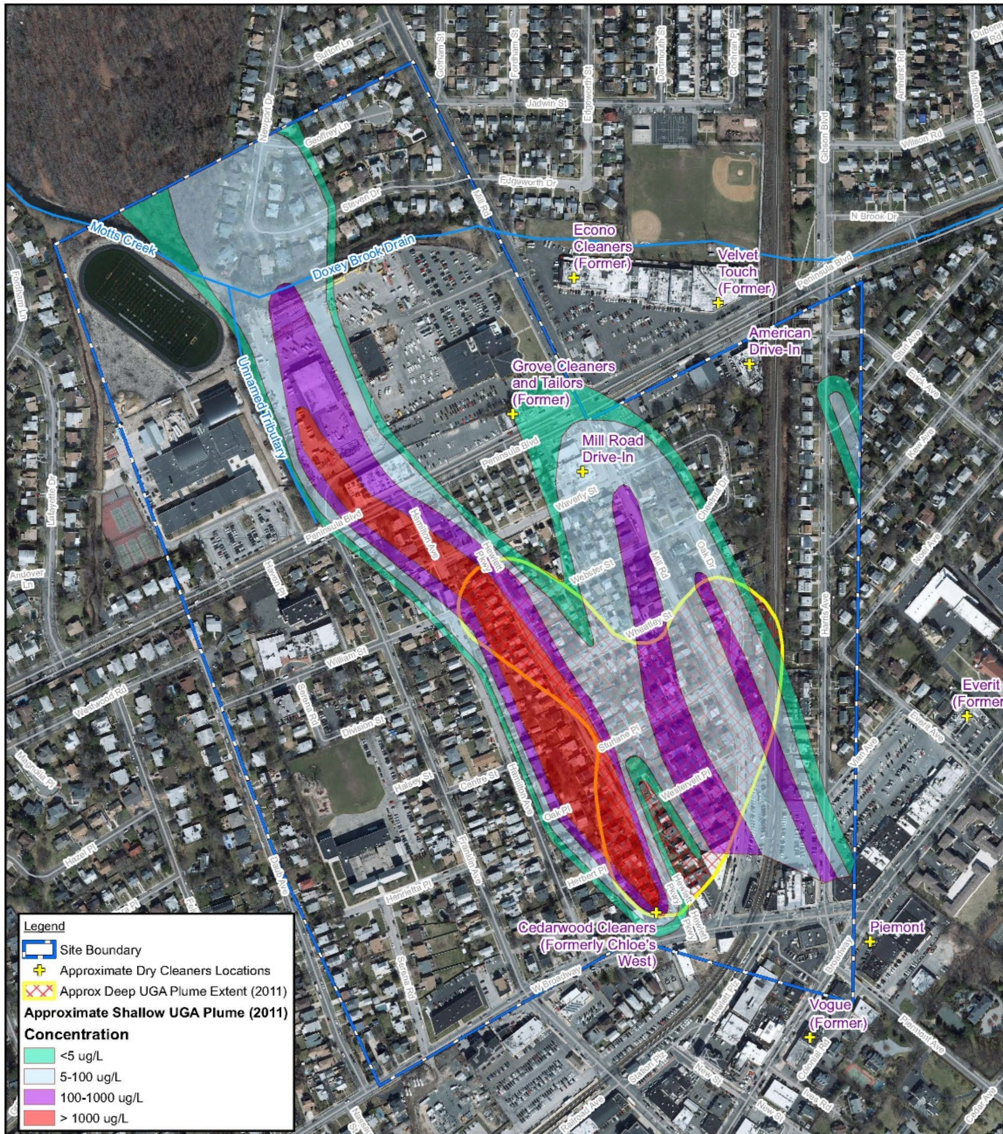
Site Background

- A groundwater plume was identified during the RI, but not the source of the contamination.

Site Background: OU1

- EPA issued a Record of Decision for Operable Unit 1 in 2011 selecting a cleanup for the groundwater plume.

- EPA completed the remedial design for the groundwater extraction and treatment, as well as in-situ bioremediation in 2016. The OU1 remedy has not yet been constructed.



0 500 1,000

Feet

Sources:
NYS Digital Ortho-imagery Program (NYSDOP)
2010 imagery in Nassau County

TETRA TECH

FIGURE 2

Site Map

Peninsula Blvd Site
Town of Hempstead, Village of Hewlett
Nassau County, New York

Site Background: OU2

- EPA conducted a Remedial Investigation for OU 2 – Source Delineation from 2012–2016.

- EPA completed the Feasibility Study of remedial alternatives for the cleanup of source areas in May 2017.

OU2 RI Field Sampling

- *Field Characterization Screening*
- *Soil Sampling*
- *Soil Gas Sampling*
- *Groundwater Sampling*
- *Water Level Measurements*

OU2 RI Results: Groundwater

PCE was detected in groundwater at levels up to 800,000 micrograms per liter (µg/l) and TCE, at concentrations up to 5,000 µg/l

PCE and TCE drinking-water standard = 5 µg/l

Maximum Contaminant Level (MCL)

OU 2 RI Results: Soil

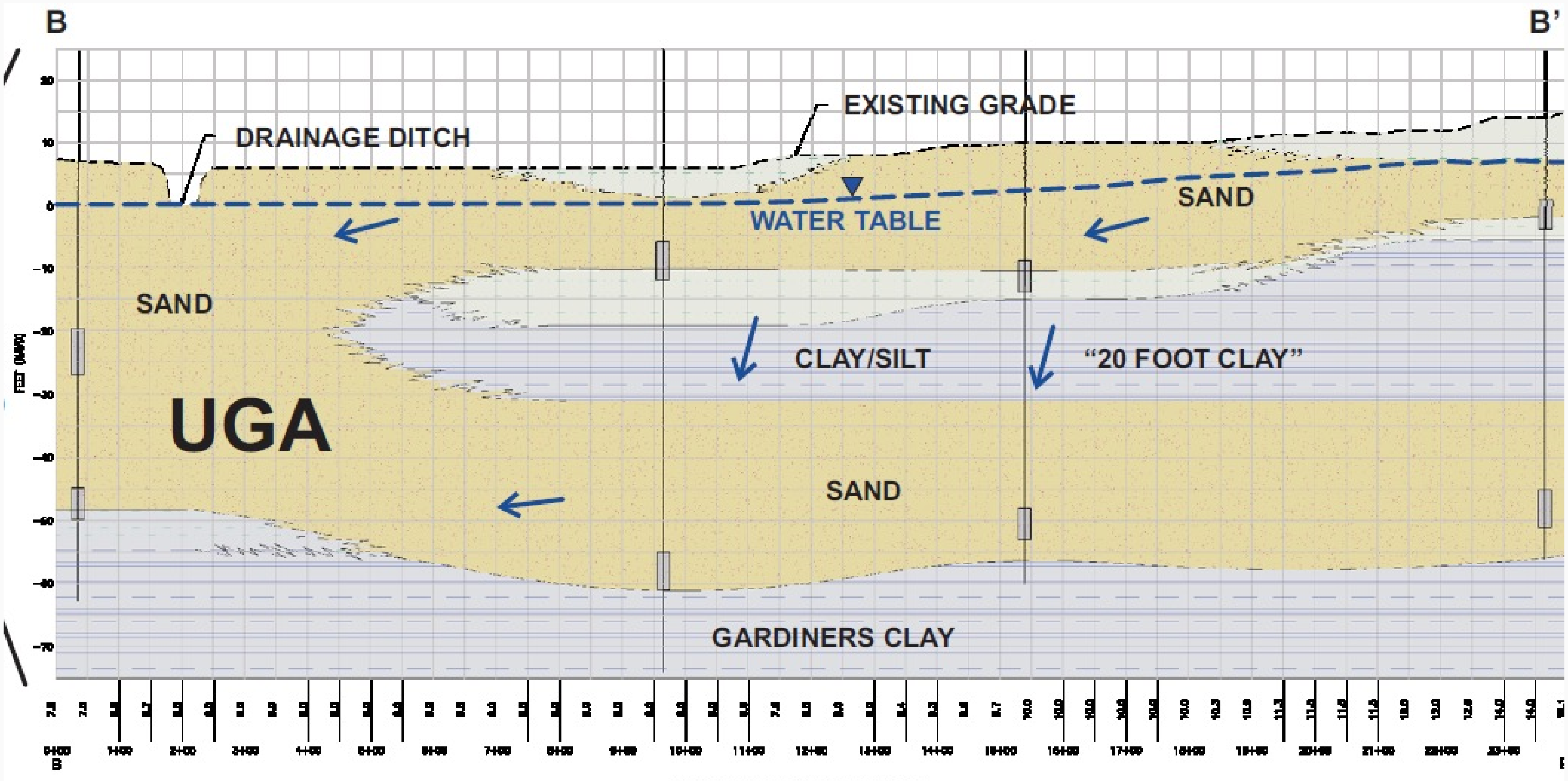
PCE was detected in soil at concentrations up to 11,100 milligrams per kilogram (mg/kg) and TCE at concentrations up to 1.8 mg/kg

NYSDEC *Protection of Groundwater Soil Cleanup Objectives* (SCOs)

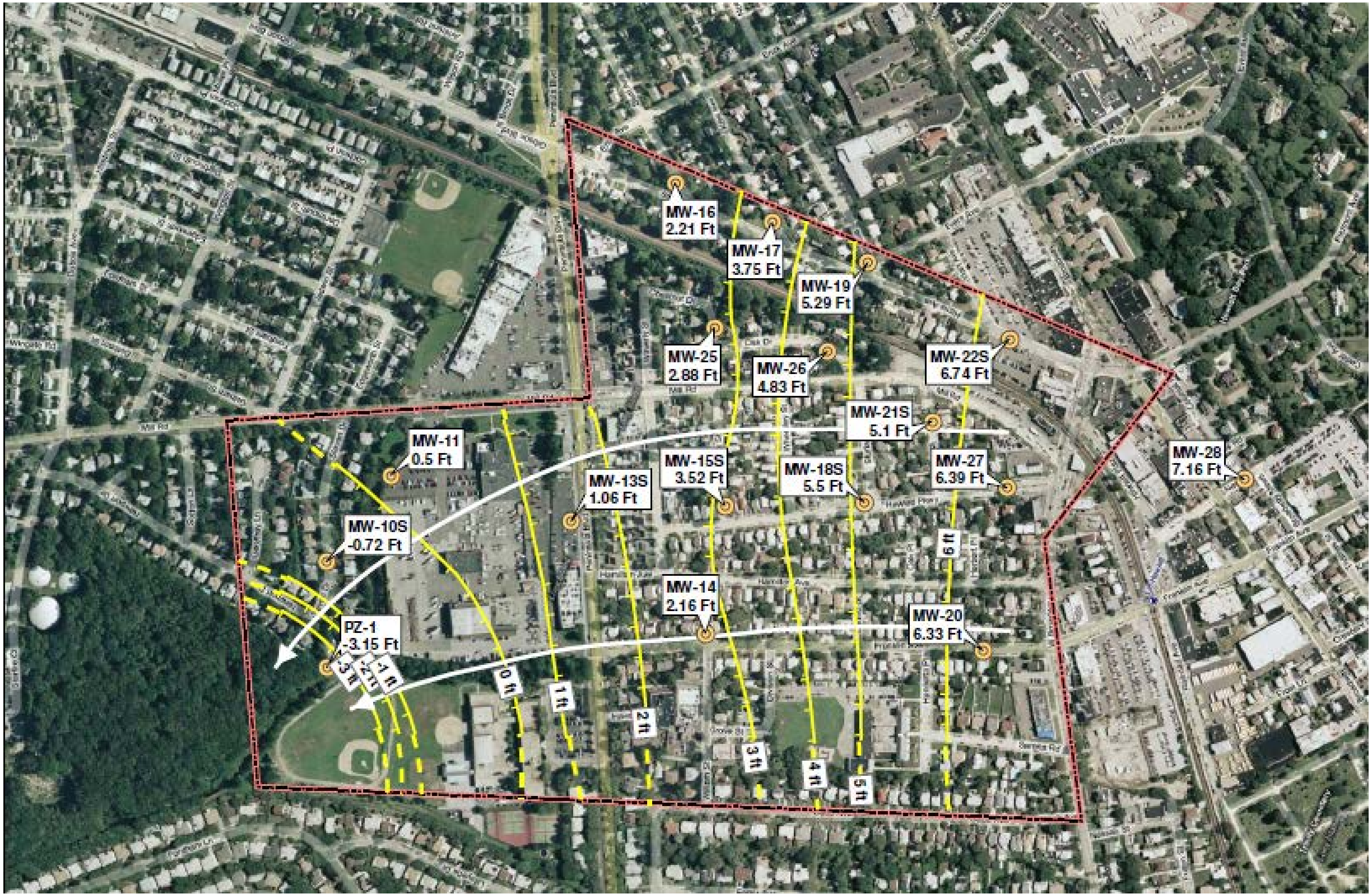
SCO for PCE = 1.3 mg/kg

SCO for TCE = 0.470 mg/kg

Site Geology



Groundwater flows to the north and the west



OU2 RISK ASSESSMENT

- *EPA conducted a risk screening evaluation for OU2, serving as a streamlined Human Health Risk Assessment*

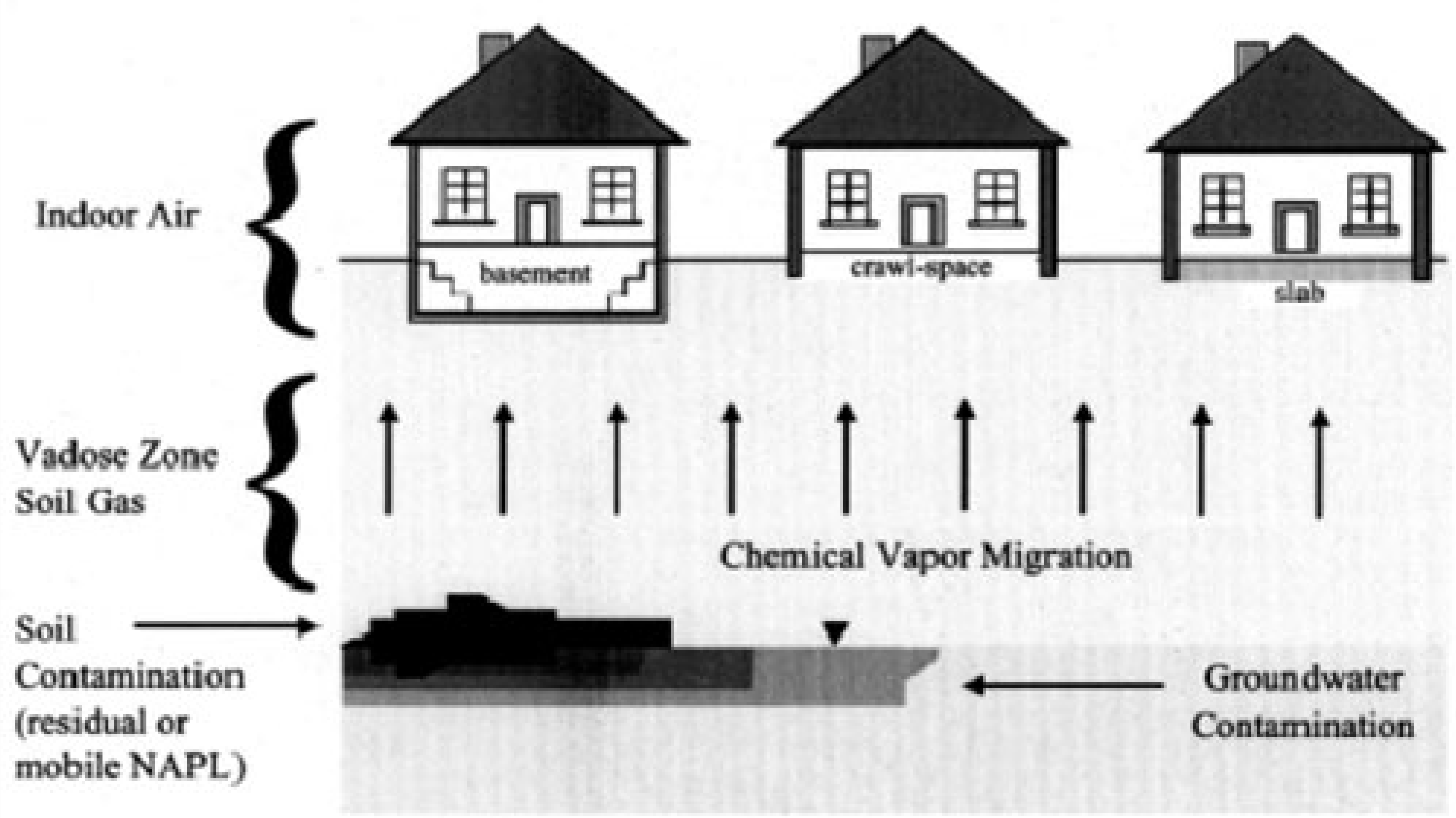
SUMMARY OF GROUNDWATER RISKS

Receptor	Hazard Index	Cancer Risk
AOC 1		
Resident	4,600	1.9E-02
AOC 2		
Resident	18	1.5E-04

OU2 RISK ASSESSMENT

- *Screening Level Ecological Risk Assessment* showed no risk to ecological receptors

SOIL VAPOR INTRUSION



SOIL VAPOR INTRUSION

EPA has conducted vapor intrusion sampling at some properties at the Site and intends to perform additional vapor intrusion sampling, pending obtaining access.

Areas of Concern 1 and 2

- Based on the results of the RI, two areas of concern requiring cleanup were identified

AREA OF CONCERN 1

AREA OF CONCERN 2

Areas of Concern 1 and 2

Figure 3: AOC 1 and AOC 2

Remedial Alternatives

Alternative 1 — *No Action*
Alternative 2 — *Air Sparging/Soil Vapor Extraction*
Alternative 3 — *In-Situ Thermal Remediation*
Alternative 4A — *In-Situ Bioremediation*
Alternative 4B — *In-Situ Bioremediation with Heat Enhanced Plume Attenuation*

Remedial Alternatives
Common Elements

All alternatives except for *No Action* contain long-term monitoring to ensure that the soil and groundwater quality improves following implementation of these alternatives until cleanup levels are achieved.

Remedial Alternatives Common Elements

All alternatives except for *No Action* contain implementation of institutional controls for soil and groundwater use restrictions (such as well permit restrictions, deed restrictions, and environmental easements) until cleanup levels are achieved.

Remedial Alternatives: Impacts to the Community

- **There may be temporary road closures in an area of high traffic density**
- **There may be temporary shutdowns of local businesses**
- **EPA will work to minimize or mitigate these impacts during the Remedial Design**

Alternative 1: No Action

- "No Action" must be compared to the other cleanup alternatives
- No action is taken to prevent future exposure to contaminated soil or groundwater
- No institutional controls are put in place
- Contaminated soil and groundwater remains in place

Alternative 2: Air Sparging/Soil Vapor Extraction, Long-Term Monitoring, Institutional Controls

Install network of vertical air injection or sparging wells into the saturated zone of the aquifer and a network of vapor extraction wells installed into the unsaturated zone.

Inject a stream of air and extract VOCs in vapor phase which would be treated aboveground with activated carbon

Alternative 3 In-Situ Thermal Remediation, Long-Term Monitoring, Institutional Controls

- In-situ thermal treatment method, such as Electric Resistivity Heating, would be used to treat contaminated groundwater and soil.

- A network of electrodes is installed into the subsurface and the heat generated by the resistance of soil to the flow of electrical current between electrodes to raise subsurface temperatures up to ~100° C.

Alternative 3 In-Situ Thermal Remediation, Long-Term Monitoring, Institutional Controls

- Heat causes the contaminants and water to evaporate, creating steam and vapor.
- Contaminated vapor and steam are extracted using vacuum extraction wells, captured and treated above-ground with granular activated carbon.

Alternative 4A: In-Situ Bioremediation, Long-Term Monitoring, Institutional Controls

- In-situ bioremediation would be used to transform the VOC contamination into non-toxic compounds.

- The in-situ bioremediation involves the injection of an electron donor, nutrients, and/or dechlorinating microorganisms as necessary into the subsurface via injection wells.

- Anaerobic biodegradation transforms chlorinated VOCs into non-toxic compounds

Alternative 4B: In-Situ Bioremediation with Heat Enhanced Plume Attenuation; Long-Term Monitoring; Institutional Controls

In-situ bioremediation the same as in Alternative 4A with

Heat Enhanced Plume Attenuation (HEPA) to assist in delivering the materials to the contamination sorbed to silty-clay layers

Remedial Alternatives Cost Analysis

Alternative	Capital Cost	Total Operation, & Maintenance Cost	Present Worth Cost
Alternative #1 – No Action	$0	$0	$0
Alternative #2 – AOC 1 – Air Sparging/Soil Vapor Extraction	$2,899,086	$7,211,883	$10,492,429
Alternative #2 – AOC 2 – Air Sparging/Soil Vapor Extraction	$1,736,759	$4,422,318	$6,399,321

Remedial Alternatives Cost Analysis

Alternative	Capital Cost	Total Operation, & Maintenance Cost	Present Worth Cost
Alt #3 – AOC 1 In-Situ Thermal Remediation	$21,632,524	$18,722,129	$41,048,610
Alt #3 – AOC 2 In-Situ Thermal Remediation	$7,256,345	$6,015,498	$13,548,991

Remedial Alternatives Cost Analysis

Alternative	Capital Cost	Total Operation, & Maintenance Cost	Present Worth Cost
Alternative #4A – AOC 1 – In-Situ Bioremediation	$3,798,403	$1,783,220	$5,866,084
Alternative #4A – AOC 2 – In-Situ Bioremediation	$1,589,854	$1,382,456	$3,186,371
Alternative #4B –AOC1 In-Situ Bioremediation with HEPA	$15,768,864	$5,332,620	$21,552,450

EPA's Nine Evaluation Criteria Detailed Screening Process

EPA uses these nine criteria to evaluate the various remedial alternatives presented in the Feasibility Study

Threshold Criteria

1. *Overall Protection of Human Health and the Environment*

2. *Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)*

Balancing Criteria

3. *Long-Term Effectiveness and Permanence*
4. *Reduction in Toxicity, Mobility or Volume through Treatment*
5. *Short Term Effectiveness*
6. *Implementability*
7. *Cost*

Modifying Criteria

8. *State Acceptance – NYSDEC concurs with the EPA's preferred remedy*

9. *Community Acceptance – acceptance of preferred alternative will be assessed following the public comment period*

Preferred Remedy

- ***For AOC 1***:

Alternative 4B: In-situ bioremediation with heat enhanced plume attenuation, long-term monitoring, and institutional controls

Preferred Remedy

- ***For AOC 2:***

Alternative 4A: In-situ bioremediation, long-term monitoring, and institutional controls

Alternative 4A: In-Situ Bioremediation; Long-Term Monitoring; Institutional Controls

In-situ bioremediation would be used to transform the VOC contamination into non-toxic compounds.

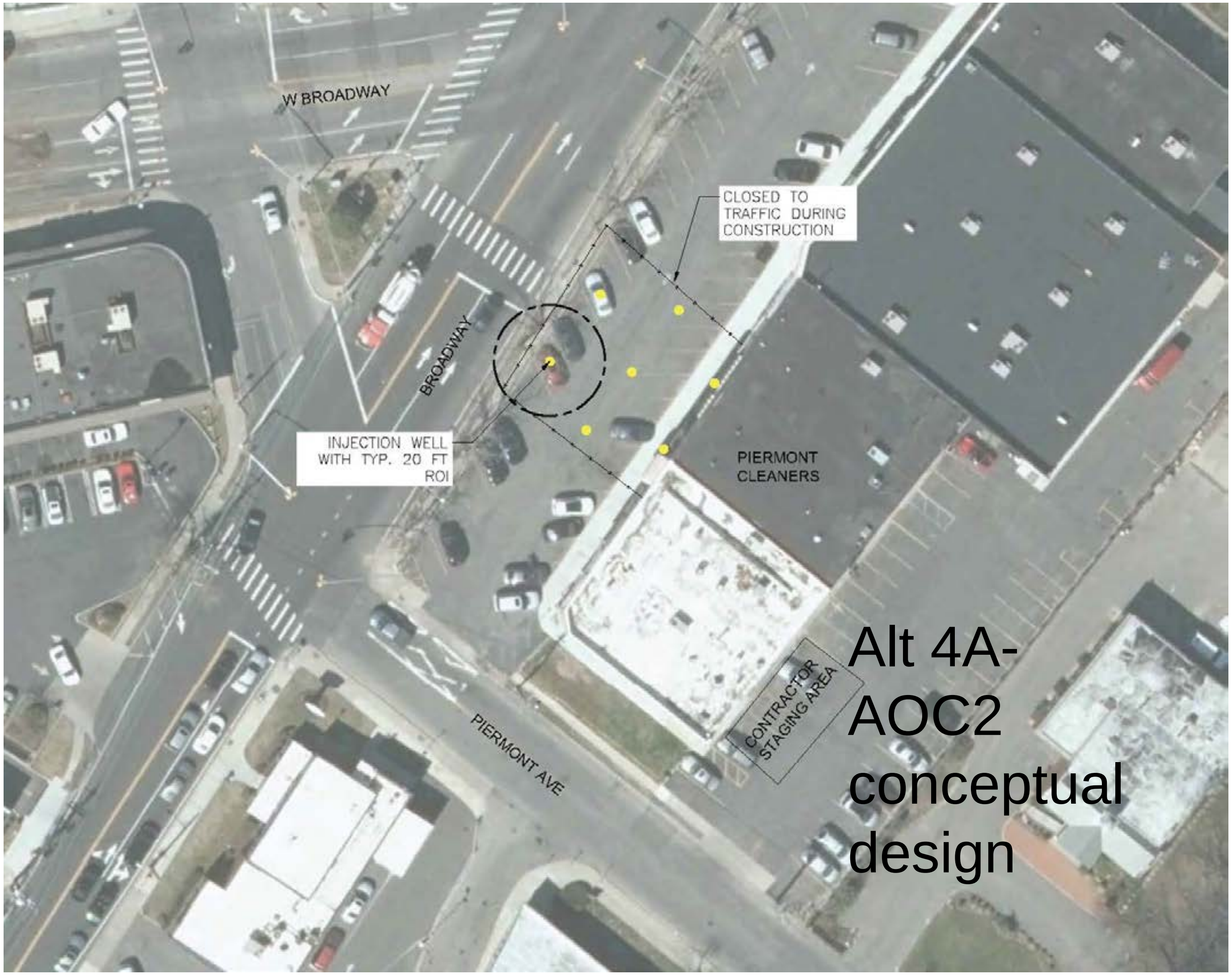
The in-situ bioremediation involves the injection of an electron donor, nutrients, and/or dechlorinating microorganisms as necessary into the subsurface.

Alternative 4A: In-Situ Bioremediation; LTM; ICs

- Electron donors include lactate, whey, and emulsified vegetable oil.
- Anaerobic biodegradation transforms chlorinated VOCs into non-toxic compounds, such as carbon dioxide, ethene, ethane, and chloride.

Alternative 4A: In-Situ Bioremediation; LTM; ICs

- Materials are delivered into the subsurface via a network of injection wells
- Associated vapor extraction wells, monitoring wells, piping and electrical equipment


W BROADWAY
BROADWAY
CLOSED TO TRAFFIC DURING CONSTRUCTION
INJECTION WELL WITH TYP. 20 FT ROI
PIERMONT CLEANERS
PIERMONT AVE
CONTRACTOR STAGING AREA
Alt 4A-
AOC2
conceptual
design

Alternative 4A: COSTS

AOC 2	
Capital Cost:	$3,798,403
Total O&M Costs:	$1,783,220
Present-Worth Cost:	$5,866,084
Construction Time:	6 months to 1 year

Alternative 4B: In-Situ Bioremediation with Heat Enhanced Plume Attenuation; Long-Term Monitoring; Institutional Controls

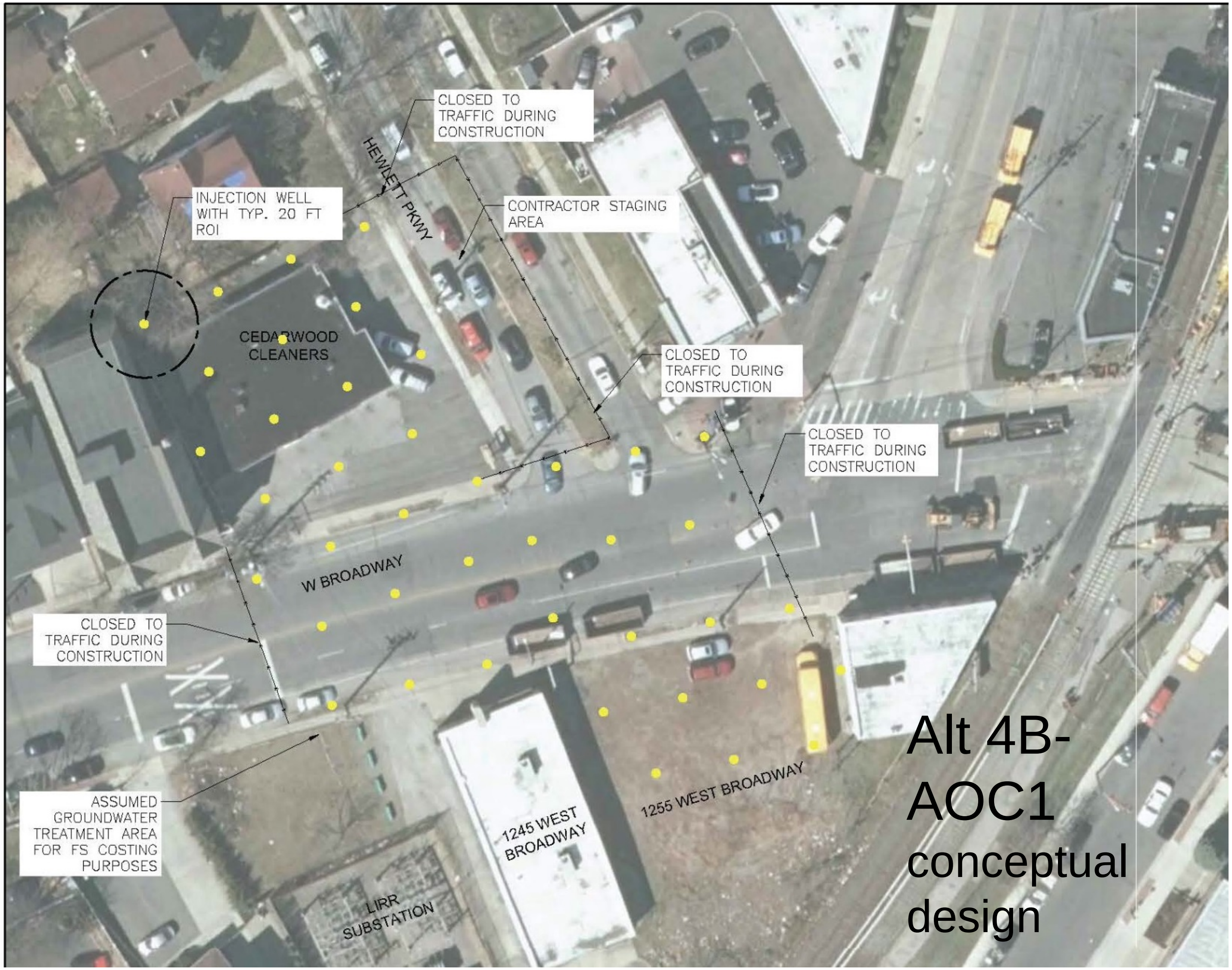
In-situ bioremediation as in Alternative 4A with

Heat Enhanced Plume Attenuation (HEPA)

Alternative 4B: In-Situ Bioremediation with HEPA; LTM; ICs

Aquifer is heated to ~40°C

Heat enhances the ability of the compounds delivered through the injection wells to the reach the areas of contamination in the subsurface



Alt 4B-AOC1 conceptual design

Alternative 4B: COSTS

AOC 1	
Capital Cost:	*$15,768,864*
Total O&M Costs:	*$5,332,620*
Present Worth Cost:	*$21,552,450*
Construction Timeframe:	*6 months to 1 year*

Questions and Answers

Please address written comments no later than
Monday, July 17, 2017 *to:*

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Peninsula Boulevard Groundwater Plume Operable Unit 2 Superfund Site

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Thank you

https://www.epa.gov/superfund/peninsula-groundwater