INSTALLATION RESTORATION PROGRAM

NAVAL SUPPORT FACILITY
INDIAN HEAD
3838 STRAUSS AVENUE
INDIAN HEAD, MARYLAND
20640-5133

RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES

Date of Meeting: May 2, 2017, 6:00 pm

RAB Member Attendees:
Mr. Joseph Rail (N) *
Mr. Curtis Detore (S)

Additional Attendees:
CAPT Mary Feinberg (N)
Mr. Andrew Louder (N)
Mr. Alex Scott (N)
Mr. Jeffrey Bossart (N)
Ms. Tara Carlson (C)
Mr. Jim Long (C)
Ms. Tara Meadows (N)
Ms. Jeron Hayes (N)

RAB Members Not in Attendance:
Mr. Robert Thomson (F)
Mr. Mark Williams (L)
Mr. Fred Pinkney (F)
Ms. Karen Wiggen (L)

* Co-chair

C= Community
F= Federal Official
K= Contractor
L= Local Official
N= Navy Official
R= Newspaper Reporter
S= State Official

Topics Discussed:
1. Arrival/Welcome

Mr. Joseph Rail of the Naval Facilities Engineering Command, Washington (NAVFAC Washington) began the meeting by conducting introductions and welcoming everyone to the Indian Head Senior Center. Copies of RAB presentations and the agenda were offered to anyone in attendance. Mr. Rail then presented the meeting agenda, which is included in Attachment A.

2. RAB Presentations

Presentations and updates were given by Mr. Rail and Mr. Scott of NAVFAC Washington and Mr. Louder of Naval Support Facility Indian Head. Mr. Rail presented the Site 38 Remedial Action Update and the Stump Neck Small Arms/Skeet Range (SASR) Engineering Evaluation/Cost Analysis (EE/CA) Overview. Mr. Louder presented the Site

17 Pilot Study Update. Mr. Scott presented the Site 57 Proton Reduction Technology (PRT) Pilot Study Results, and the Fiscal Year (FY) 17 Five-Year Review Results Update. Copies of all presentations are included in Attachment D.

3. Comments, Questions and Answers

Numerous comments were made and questions asked during the meeting. These comments, questions and answers are provided in Attachment B. Additional correspondence concerning the Installation Restoration Program (IRP) or the Munitions Response Program (MRP) at the facility can be directed to:

Public Affairs Officer
Naval Support Facility South Potomac
Attn: Public Affairs Officer, Code 00P
6509 Sampson Rd.
Dahlgren, VA 22448-5108
PHONE: (540) 284-0129
FAX: (540) 653-4269
Email: jeron.hayes@navy.mil

4. Meeting Adjourn

Mr. Rail presented the tentative agenda for the next RAB meeting, which is scheduled for October 19, 2017. A copy of the draft agenda is included in Attachment C. Mr. Rail then concluded the meeting at 7:45 pm and thanked everyone in attendance.

Attachment A

NAVAL SUPPORT FACILITY INDIAN HEAD
INSTALLATION RESTORATION (IR) PROGRAM
RESTORATION ADVISORY BOARD (RAB) MEETING AGENDA

May 2, 2017

6:00 - 6:05 pm	**ARRIVAL/WELCOME** Mr. Joseph Rail Naval Facilities Engineering Command, Washington (NAVFACWASH) Remedial Project Manager
6:05 – 6:20 pm	**SITE 38-RUM POINT LANDFILL REMEDIAL ACTION UPDATE** Mr. Joseph Rail
6:20 – 6:45 pm	**STUMP NECK SMALL ARMS/SKEET RANGE ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) OVERVIEW** Mr. Joseph Rail
6:45 – 7:00 pm	**SITE 17 PILOT STUDY UPDATE** Mr. Andrew Louder
7:00 – 7:15 pm	**SITE 57 PROTON REDUCTION TECHNOLOGY UPDATE** Mr. Alex Scott
7:15 – 7:30 pm	**FY17 FIVE-YEAR REVIEW UPDATE** Mr. Alex Scott
7:30 pm	**ADJOURN**

Attachment B

INSTALLATION RESTORATION PROGRAM

NAVAL SUPPORT FACILITY
INDIAN HEAD
3838 STRAUSS AVENUE
INDIAN HEAD, MARYLAND
20640-5133

RESTORATION ADVISORY BOARD (RAB) MEETING
COMMENTS, QUESTIONS AND ANSWERS
May 2, 2017

Arrival/Welcome

No questions were asked nor comments made during this topic.

SITE 38-RUM POINT LANDFILL REMEDIAL ACTION UPDATE

Question: What type of Seed Mixture was used/how was it determined.

Answer: A native Ernst seed mix ((ERNMX-731) MD Coastal Plain UPL Meadow Mix) was used as specified by the installation's Natural Resources personnel.

STUMP NECK SMALL ARMS/SKEET RANGE ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) OVERVIEW

Question: What is a Skeet Range? Are all of the sites skeet ranges?

Answer: Clay pigeons launched from trap-houses and shot with a shotgun loaded with shotshells. No.

Question: How did nitroglycerin show up as a COC?

Answer: It was discovered during previous investigations.

Question: Time frame of small arms range removal action?

Answer: Work is expected to begin following approval of all Work Plans sometime in 2018 and will take approximately 5 months to complete.

Question: What does it mean to stabilize the lead then ship?

Answer: Lead may leach from soils from rain water at high concentrations that would be considered toxic and classify the soil as a hazardous waste. The soil is treated with substances to “stabilize” the soil to minimize leaching, which allows for its disposal at a normal landfill facility as non-hazardous waste.

SITE 17 PILOT STUDY UPDATE

Question: What does IR stand for?

Answer: Installation Restoration (site name program identifier)

Question: After how much time will you know if the pilot is successful?

Answer: There will be measurements taken during an evaluation period of one year from the application of the technology.

Question: Will chlorinated organics (CVOCs) flow toward injection columns, or will injected material flow outward?

Answer: The technology’s modeling considers the gradient to move the contamination towards the reaction (injection) columns, from the site’s clays.

Question: Has Trichloroethene (TCE) transported out of the sand and into the clay layer?

Answer: Based on site investigations, the CVOCs are primarily within the clay layer at the site, and the CVOCs back-diffuse from the clays into the sandy aquifer’s groundwater. There is no ascertainable product within the sandy layer at the site.

Question: Why is the work called a “pilot-study”, and will it be applied full-scale at the whole site?

Answer: A pilot-study is used to prove-out a remedial technology at a site before it is implemented full-scale, or the site is evaluated to require further consideration. The remedial technology will only be implemented full-scale if it is found to be successful and the subsequent implementation would significantly improve remedy performance.

Question: Have all contaminants diffused into the Mattawoman from subsurface soils.

Answer: There is no evidence that CVOCs discharged, or are currently discharging into the Mattawoman from the site's subsurface soils.

Question: Did you measure the permeability of the soils (clay) at the site?

Answer: Although not directly measured, the site's clay has been analyzed using a Shelby Tube to determine transmissivity at a rate of 6.5×10^{-4} feet/day. This is much less transmissive than the sandy-soil layers above it, and is considered to act as a confining layer, protecting lower aquifer formations from contamination.

Question: When will work be completed?

Answer: Work is anticipated to start in July 2017, after Bald-Eagle nesting season. Field work will occur over one month (approximately).

SITE 57 PROTON REDUCTION TECHNOLOGY (PRT) PILOT-TEST RESULTS

Question: Why is the remedial technology different than Site 17, for a similar TCE issue?

Answer: Each site has site-specific conditions which makes one technology more feasible than another. Site 57 has extensive infrastructure, active building operations, different local hydrogeology, and existing injection wells, which is much different from Site 17's conditions.

Question: Why monitor acidity?

Answer: PRT produces “free hydrogen” ions which lowers pH. Lower pH can confound bioremediation and may require buffering to maintain pH ideal for bioremediation.

Question: So the results were the same as not turning on the PRT?

Answer: Yes, the pilot study demonstrated that the reductions in COCs were the result of the amendment injections to stimulate bioremediation and were not affected by the PRT itself.

Question: Path forward?

Answer: Considering the results of the study, additional injections may be effective in reducing COC concentrations. However, the site will continue to be evaluated to optimize the existing remedy, and develop a path forward eventually leading towards site closure, or a low-maintenance and monitoring solution until conditions for site closure are achieved.

FY 17 FIVE-YEAR REVIEW (5YR) UPDATE

Question: Why use industrial standards compared to residential at UXO 32?

Answer: Based on the current and future land use, the industrial standards were appropriate criteria to determine an acceptable low-maintenance regime of land use controls (LUCs) and institutional controls (ICs), and have the site continue to be protective of human health and the environment.

Question: Not enough data for trends, length of trends necessary?

Answer: The data review portion of the 5YR, per guidance from the EPA, requires the consideration of long-term and short-term protectiveness. A site needs sufficient data points of adequate quality to have statististically meaningful trend analysis. This will determine if COC trends are increasing, decreasing, or remaining stable.

Question: If there is monitoring, then a site goes to the 5YR?

Answer: Sites that have records of decisions (RODs), and have contaminant concentrations that prevent its unrestricted closure must have ongoing 5YRs. Long-term monitoring is one part of a remedy's operation that allows for sufficient data collection to determine a site's current, continued, and future protectiveness.

GENERAL QUESTIONS

Question: Is there contaminant migration into the Mattawoman creek?

Answer: Based on the results of current investigations and monitoring, there is no known migration of site COCs from IR or munitions response sites into the Mattawoman creek at this time.

Question: What is happening to the coal ash?

Answer: The demolition and removal of the coal-fired boiler plant at Indian Head includes the removal and disposal of its stored wastes. However, the IR program does not oversee this disposal. But we are commited to ensuring that any potentially hazardous contamination from residuals will be addressed as appropriate under our program.

Attachment C

NAVAL SUPPORT FACILITY INDIAN HEAD
INSTALLATION RESTORATION (IR) PROGRAM
RESTORATION ADVISORY BOARD (RAB) DRAFT MEETING AGENDA

October 19, 2017

6:00 - 6:05 pm	**ARRIVAL/WELCOME** Mr. Joseph Rail Naval Facilities Engineering Command, Washington (NAVFACWASH) Remedial Project Manager
6:05 – 6:30 pm	**FY18 BUDGET UPDATE** Mr. Joseph Rail
6:30 – 6:45 pm	**STUMP NECK MRP SITES REMEDIAL INVESTIGATION UPDATE** Mr. Joseph Rail
6:45 – 7:00 pm	**SITE 38-RUM POINT LANDFILL REMEDIAL ACTION UPDATE** Mr. Joseph Rail
7:00 – 7:15 pm	**SITE 43-TOLUENE DISPOSAL AREA PRE-DESIGN INVESTIGATION UPDATE** Mr. Andrew Louder
7:15 – 7:30 pm	**SITE 66-TURKEY RUN DISPOSAL AREA BASELINE ECOLOGICAL RISK ASSESSMENT** Mr. Andrew Louder
7:30 – 7:45 pm	**SITE 67-HOG-OUT FACILITY FEASIBILITY STUDY UPDATE** Mr. Alex Scott
7:45 – 8:00 pm	**SITE 69-BUILDING 1018 REMEDIAL INVESTIGATION UPDATE** Mr. Alex Scott
8:00 pm	**ADJOURN**

Attachment D- RAB Presentations

SITE 38- RUM POINT LANDFILL REMEDIAL ACTION UPDATE

Presented By
Joseph Rail
Naval Facilities Engineering Command (NAVFAC)
Washington

5/2/17

Site 38-Rum Point Landfill Location

Project Overview

Site Background:

- Located on Stump Neck Annex, 2 acres in size, inactive since 1989
- Record of Decision (ROD) signed in 2014
- Final remedy of landfill removal, monitoring, and land use controls
- Wastes include scrap metal, tires, wood, concrete, and potential munitions items

Sequence of Fieldwork:

- Excavation of landfill has been completed down to native soil and no wastes remain
- All Munitions and Explosives of Concern/Material Potentially Presenting an Explosive Hazard (MEC/MPPEH) removed
- Soil, construction debris, and scrap metal have been disposed off site
- Clean soils used to backfill borrow source area
- Site restoration completed (topsoil, seeding, and planting)

Pre- and Post-Excavation

U.S. Navy

U.S. Navy

U.S. Navy

MPPEH Demolition-October 2016

U.S. Navy

U.S. Navy

U.S. Navy

Detonation Trench Setup

U.S. Navy

U.S. Navy

Post-Detonation Conditions

U.S. Navy

U.S. Navy

U.S. Navy

Concrete Stockpile

U.S. Navy

U.S. Navy

MPPEH Encased in Concrete-November 2016

U.S. Navy

U.S. Navy

U.S. Navy

Backfilling Borrow Source Area

U.S. Navy

Before

U.S. Navy

After

Final Grading

U.S. Navy

U.S. Navy

Drainage Channel Restoration

U.S. Navy

U.S. Navy

U.S. Navy

U.S. Navy

Topsoil & Hydroseeding

U.S. Navy

U.S. Navy

U.S. Navy

Straw & Erosion Control Matting

U.S. Navy

U.S. Navy

U.S. Navy

U.S. Navy

Restoration Completion- April 2017

U.S. Navy

U.S. Navy

Restoration Completion- April 2017

U.S. Navy

Before

U.S. Navy

After

Site 38 Remedial Action Summary

Project Cost/Length:

- Approximately $5.8 mil total to date
- 18 months to complete RA

Project Successes:

- Potential for site to be unlimited use/unrestricted exposure (UU/UE)
- Considerable savings for future long-term monitoring (LTM) (cost reduction potential of $750K or more)
- 63,760 lbs. MDAS recovered from site
- 3,594 lbs. MPPEH recovered
- 46,100 lbs. of general trash and construction debris collected
- 53,820 lbs. metal recycled
- 835 tons concrete awaiting processing

Contacts and Questions

Points of Contact:

- **NAVFAC Washington:** Joseph Rail
- **NAVFAC Washington (Base RPM):** Andrew Louder

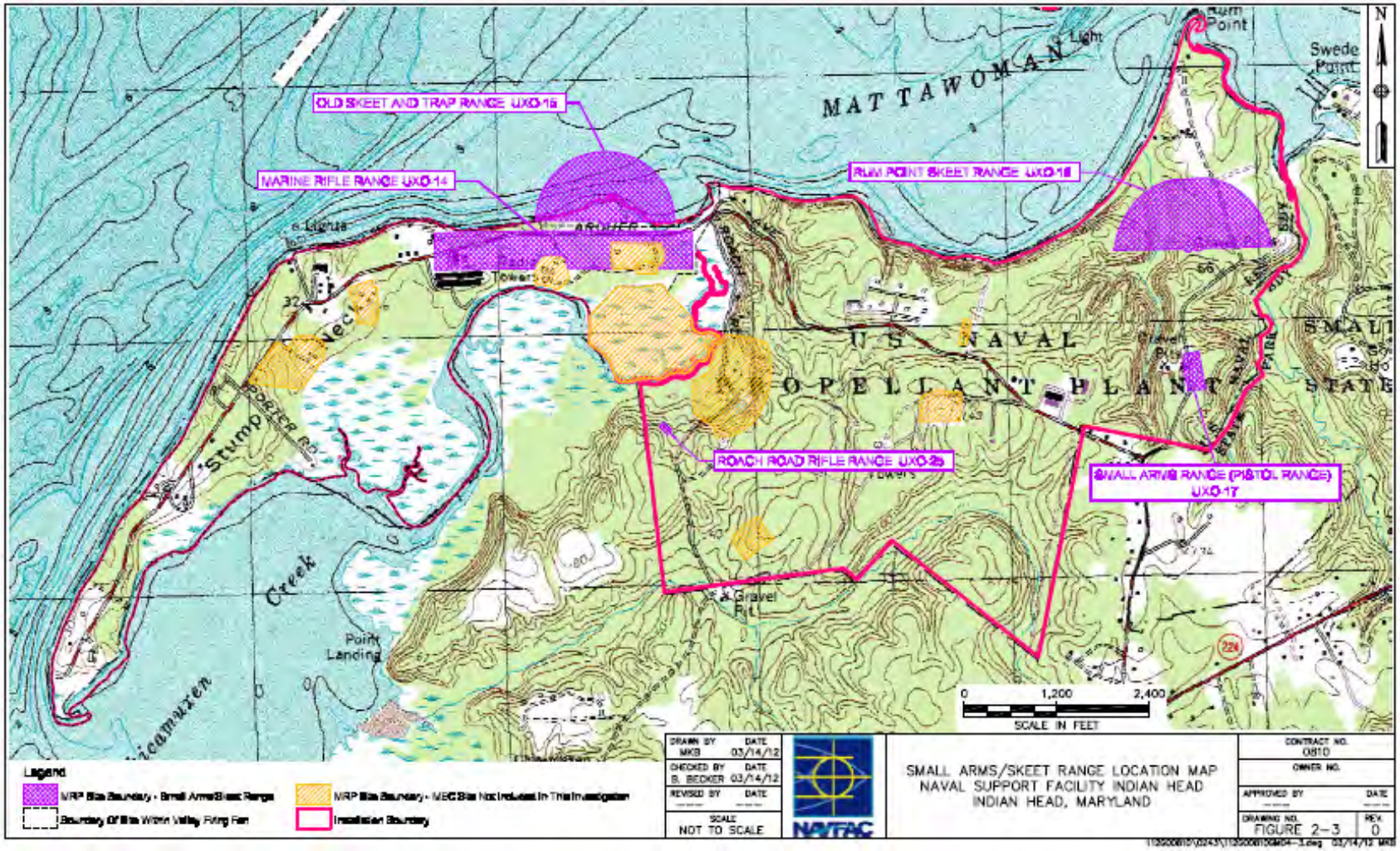
Questions ?

STUMP NECK SMALL ARMS/SKEET RANGE EE/CA OVERVIEW

Presented By
Joseph Rail
Naval Facilities Engineering Command (NAVFAC)
Washington

5/2/17

Small Arms/Skeet Range Locations



Site Photos

UXO 14- Marine Rifle Range

U.S. Navy

U.S. Navy

UXO 15- Old Skeet and Trap Range

U.S. Navy

UXO 16- Rum Point Skeet Range

Site Photos

UXO 17- Small Arms (Pistol) Range

U.S. Navy

UXO 25- Roach Road Rifle Range

U.S. Navy

Project Overview

EE/CA Outline:

1. Introduction and Description
2. Site Characterization
3. Identification of Removal Action Objectives
4. Identification and Analysis of Removal Action Alternatives
5. Comparative Analysis of Removal Action Alternatives
6. Recommended Removal Action Alternative

Site Background

UXO 14- Marine Rifle Range- 30.4 acres, used from 1911 to 1918 for rifle training, includes multiple firing lines, two target berms, and hillside impact area.

UXO 15- Old Skeet and Trap Range- 29.3 acres, used from 1967 to 1991 for small arms recreational activity, includes two firing points and associated impact area.

UXO 16- Rum Point Skeet Range- 33.5 acres, used from 1991 to 2001 for small arms (shotgun) recreational activity, includes two firing pads and associated shot fall areas.

UXO 17- Small Arms (Pistol) Range- 2 acres, used from mid-1980s to 1991 for small arms training, includes three firing lines, a target area, and hillside impact area.

UXO 25- Roach Road Rifle Range- 0.3 acres, used from 1967 to 1986 for small arms (rifle and pistol) training, included eight firing stands, six targets, and impact area.

EE/CA Section 2

Site Characterization:

2.1 Site Description and Background

2.2 Previous Removal Actions

2.3 Previous Investigations

2.4 Source, Nature, and Extent of Contamination

2.5 Streamlined Risk Evaluation

Risk Screening

Streamlined Human Health Risk Screening Evaluation:

- **Soil COPCs were identified by comparing C_{max} to risk-based screening levels and background**
- **Risk indicators were calculated based on direct exposure to C_{max} for each soil COPC:**
  - **ILCR= Incremental Lifetime Cancer Risk (acceptable if $<1x10^{-4}$)**
  - **HI= Hazard Index (acceptable if <1)**
  - **Pb= Lead risk acceptable if C_{max}<400 ppm (residential) or 800 ppm (industrial) based on EPA model results for blood lead concentrations**

Contaminants of Concern

Site	Subarea	COC[1]	
		Surface Soil	Subsurface Soil
MRR - UXO 14	Hillside Impact Area	Lead	Lead
OSTR - UXO 15	Firing Points/Target Area	PAHs	--
	NW Shot Fall Area	Lead	--
	NE Shot Fall Area	Lead	--
RPSR - UXO 16	Firing Points/Target Area	PAHs	--
SAPR - UXO 17	Firing Line Area	Nitroglycerin	--
	Target Area	Lead[2]	--
RRRR - UXO 25	Target Area	Lead	--

[1] COCs include contaminants that are present at concentrations that pose unacceptable risks to potential human health and ecological receptors. Contaminants discussed in the text as ecological COPCs are not included on this list of COCs, but are addressed in Section 3.4 and Appendix E. Addressing human health risk in soil at the site(s) also will address ecological risks.

[2] Due to the visible evidence of soil sloughing from the face of the backstop berm in the UXO 17 Target Area, "surface soil" was considered to be soil from 0 to 4 feet bgs along the base of the berm.

EE/CA Section 3

Identification of Removal Action Objectives:

3.1 Statutory Limits on Removal Action

3.2 Compliance With Applicable or Relevant and Appropriate Requirements

3.3 Removal Action Objectives

3.4 Removal Action Scope

3.5 Removal Action Schedule

Removal Action Objectives

RAOs:

- **Mitigate potential human health risks due to direct exposure to lead, PAHs, and nitroglycerin contamination in soil**
- **Mitigate the potential erosion of contaminated soil, transport of contaminants, and subsequent exposure**
- **Ensure that post-removal action conditions provide an acceptable level of protection for ecological receptors against direct exposure and exposure via the food chain to lead, collocated metals, nitroglycerin, and PAHs in soil**

Cleanup Goals

Chemical	Residential Soil [1] (mg/kg)
Lead	400
BaP Equivalent [2]	1.2
Nitroglycerin	6.3

Notes

1. The references for soil cleanup goals are: EPA Regional Screening Levels for Soil (May 2016) and Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (EPA OSWER 9355.4-12, August 1994).
2. The *Benzo(a)pyrene (BaP) Equivalent* value is based on the EPA 1993 toxicity equivalency factors and the concentrations of the seven individual carcinogenic PAHs:

   BaP Equivalents = (0.1) benzo(a)anthracene + (1.0) benzoa(a)pyrene + (0.1) benzo(b)flouranthene + (0.01) benzo(k)flouranthene +(0.001) chrysene + (1.0) dibenz(a,h)anthracene + (0.1) ideno(1,2,3cd)pyrene.

Alternatives

EE/CA Removal Action Alternatives:

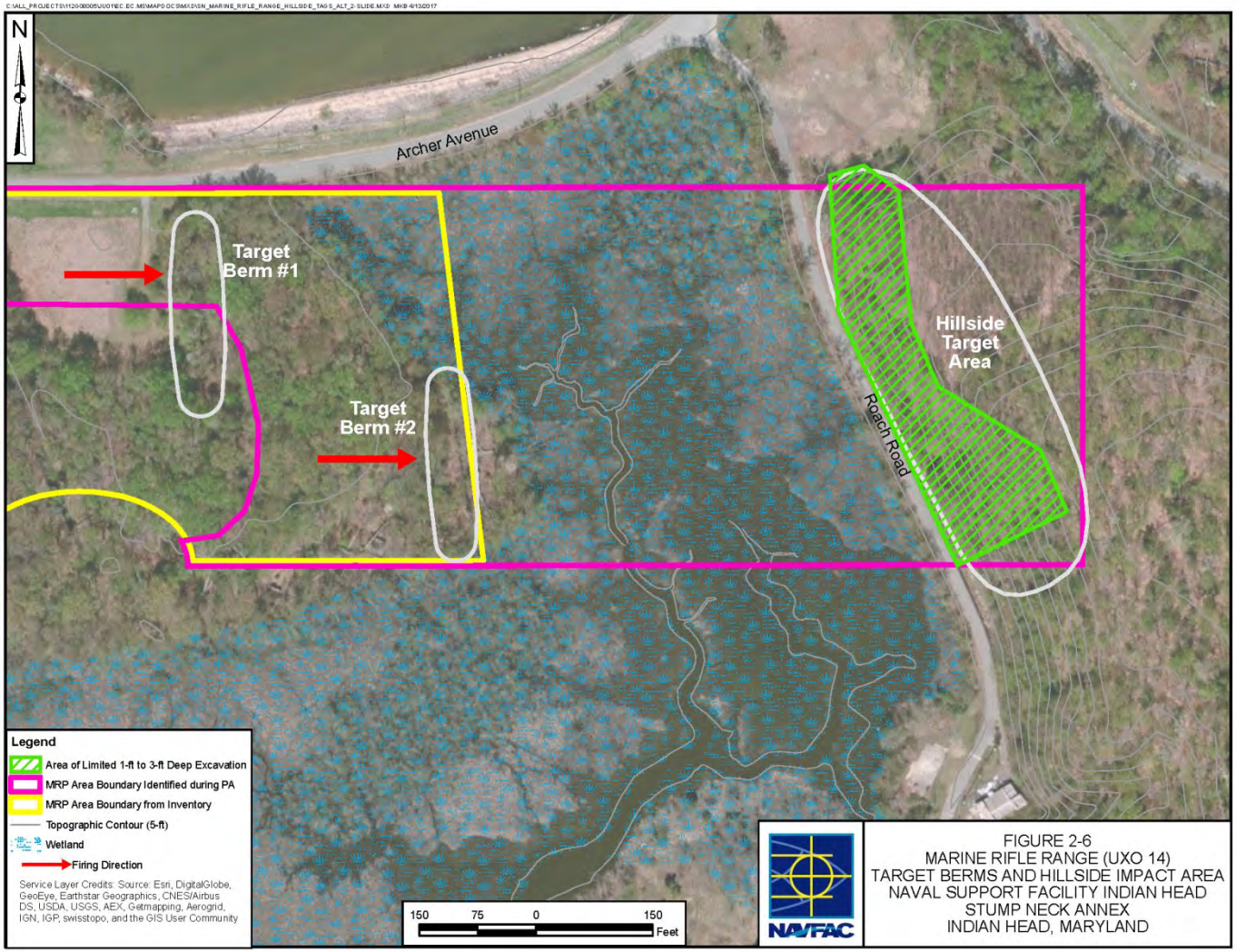
- **Alternative 1: No Action**
- **Alternative 2: Excavation and Off-Site Disposal**
- **Alternative 3: In-Situ Treatment, Excavation, and Off-Site Disposal**

Recommended Alternative

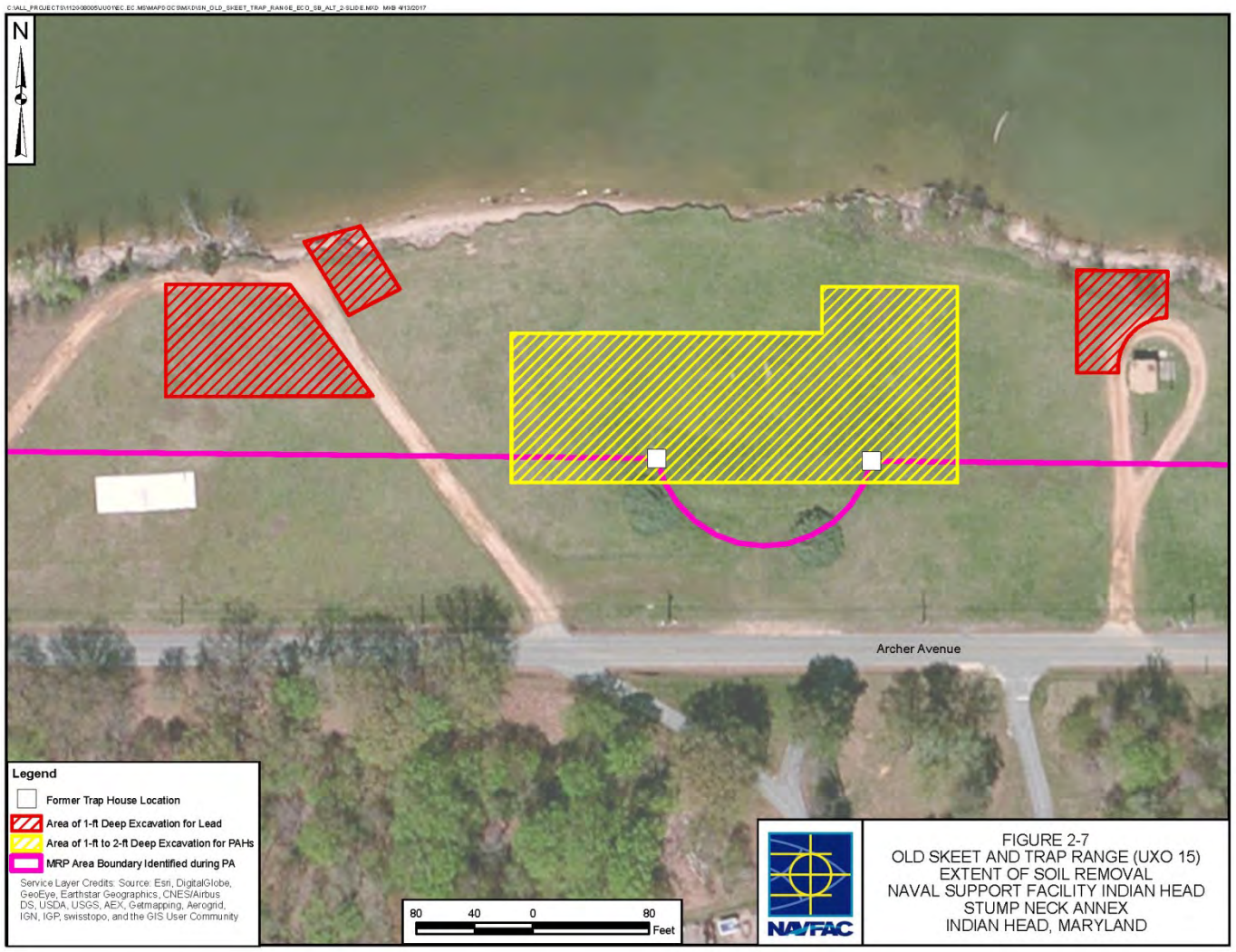
Alternative 3: In-Situ Treatment, Excavation, and Off-Site Disposal Includes:

- **In-situ chemical treatment (via Maectite) to stabilize leachable lead**
- **Excavation of all lead-, PAH-, and nitroglycerin-contaminated soil and off-site disposal as nonhazardous waste**
- **Site prep, UXO escort, cultural resources escort, waste characterization, soil excavation, confirmation sampling, and site restoration**
- **Total excavation area of 154,487 ft^2 with a volume of 8,809 c.y. of contaminated soil removed**
- **3,048 tons of hazardous lead-contaminated soil treated in-situ**
- **13,081 tons of contaminated soil (3,810 tons lead-contaminated soil, 8,673 tons PAH-contaminated soil, and 598 tons nitroglycerin-contaminated soil) shipped off-site for disposal as non-hazardous waste**

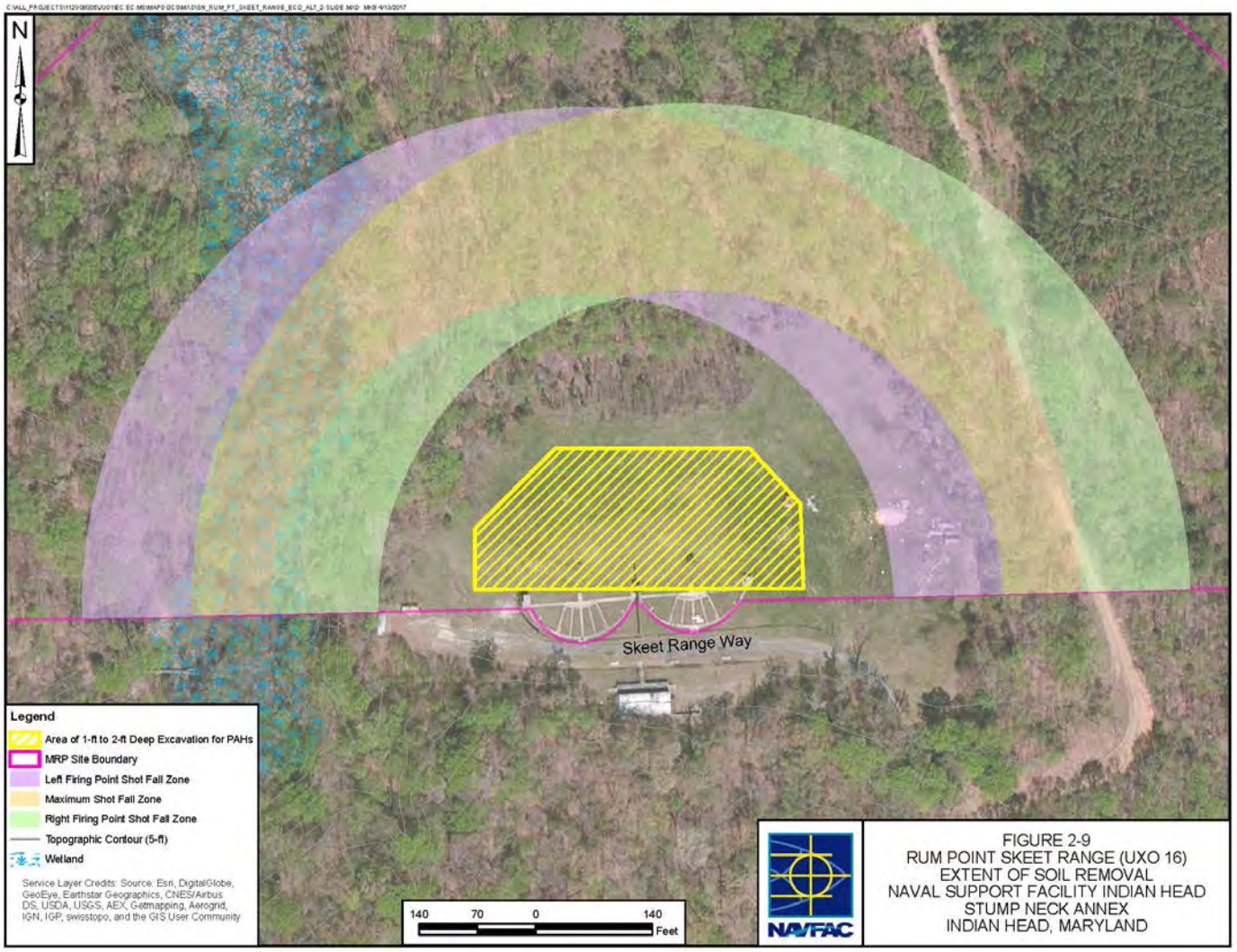
UXO 14- Marine Rifle Range Removal Area



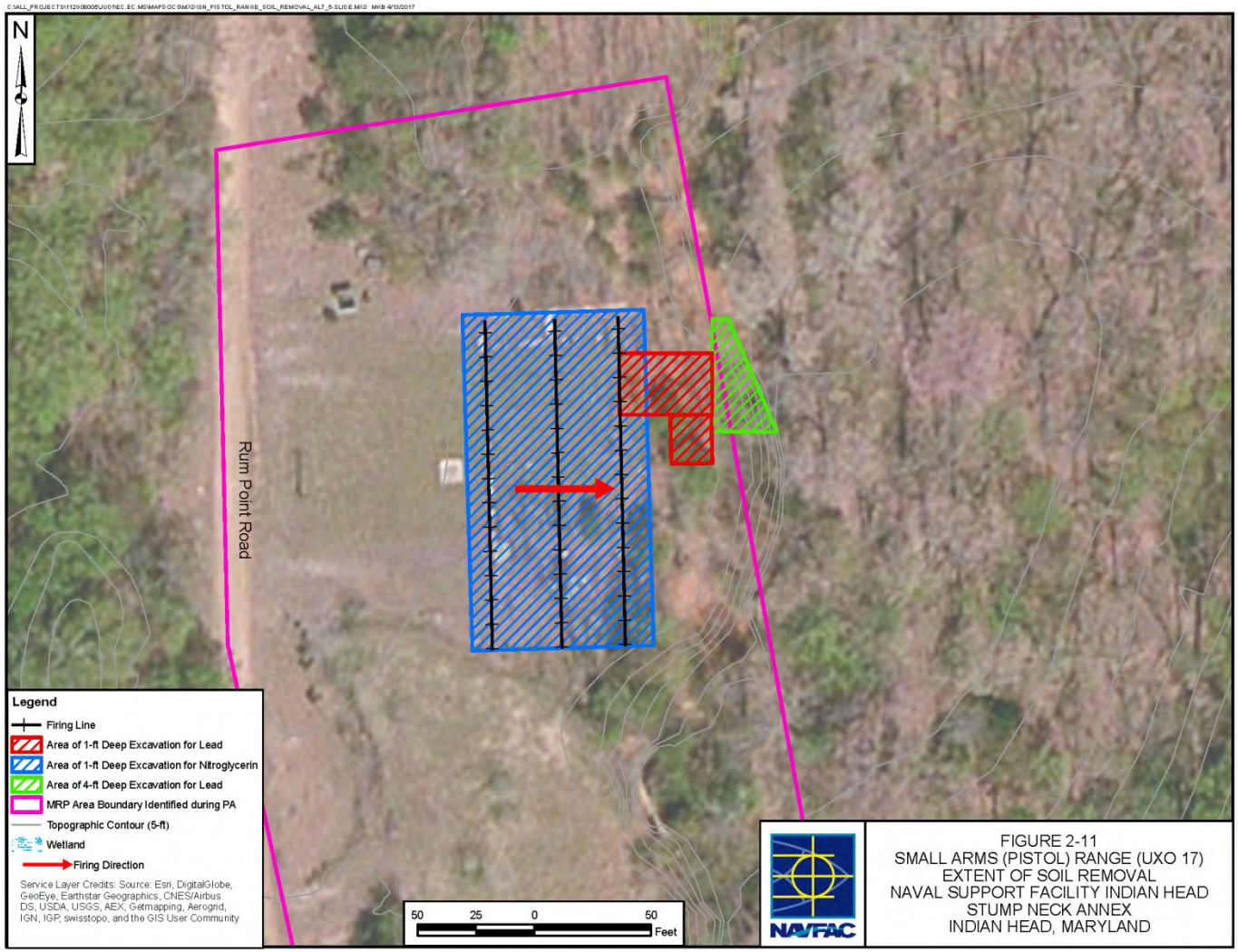
UXO 15- Old Skeet & Trap Range Removal Area



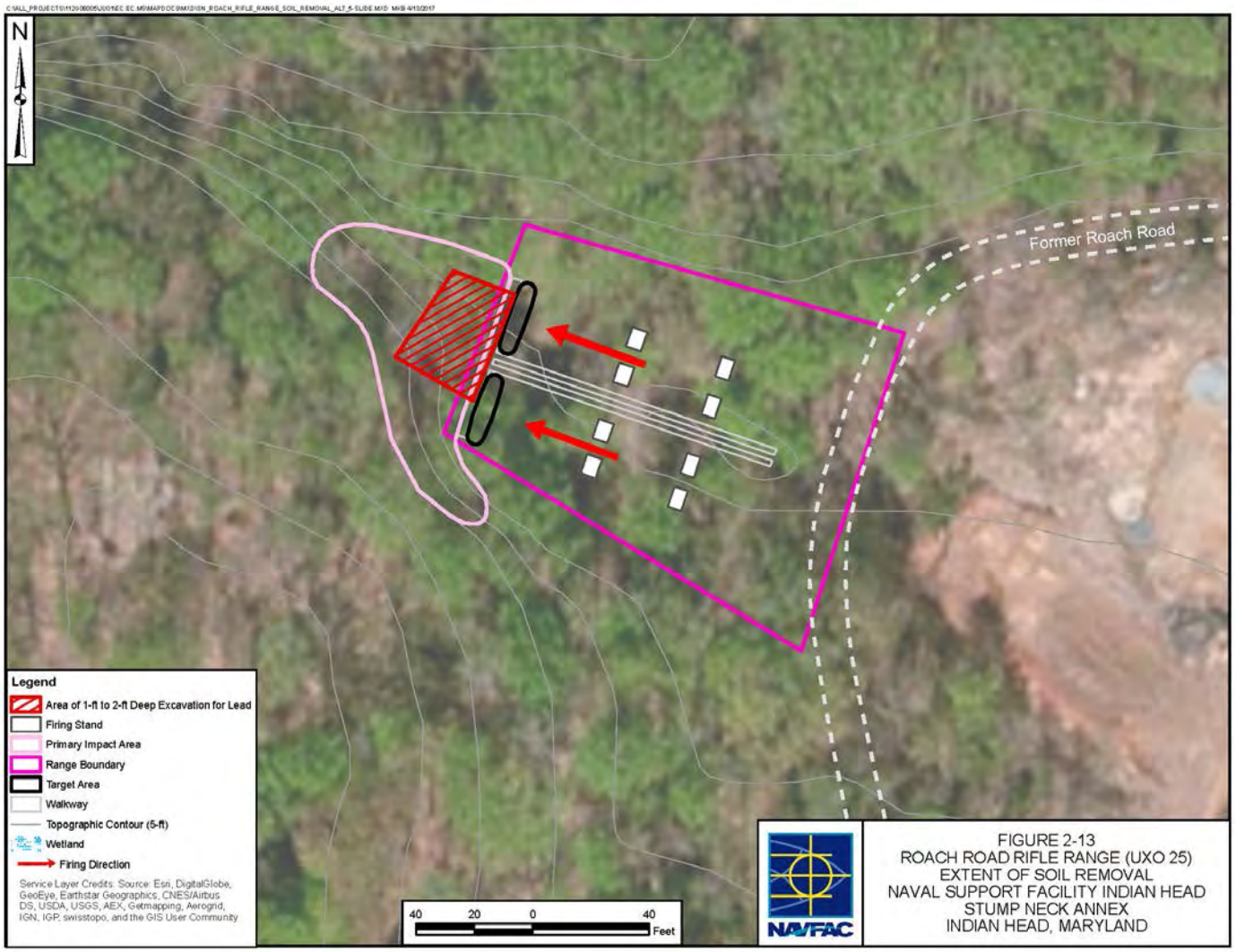
UXO 16- Rum Point Skeet Range Removal Area



UXO 17- Small Arms (Pistol) Range Removal Area



UXO 25- Roach Road Rifle Range Removal Area



Current Status

- EE/CA Public Review period ran from March 15th to April 15th, 2017
- No substantial comments received
- Final EE/CA will support an Action Memorandum to be signed by the installation
- Contract award of the removal action cleanups planned for Summer 2017
- Work Plan and fieldwork planned for FY18
- Expected to reach clean closure with No Further Action (NFA) required

Contacts and Questions

Points of Contact:

- **NAVFAC Washington:** Joseph Rail
- **NAVFAC Washington (Base RPM):** Andrew Louder

Questions ?

IR 17- Disposed Metal Parts Along Shoreline
ESTCP Pilot Test

Presented By
Andrew Louder-IR/MRP Manager
Naval Facilities Engineering Command (NAVFAC)
Washington

05/02/2017

Presentation Objectives

Objective:

- Discuss upcoming pilot study of the North Plume at IR Site 17 at Naval Support Facility, Indian Head, MD
  - Background of IR 17
  - Pilot Study Technology
  - Anticipated Performance

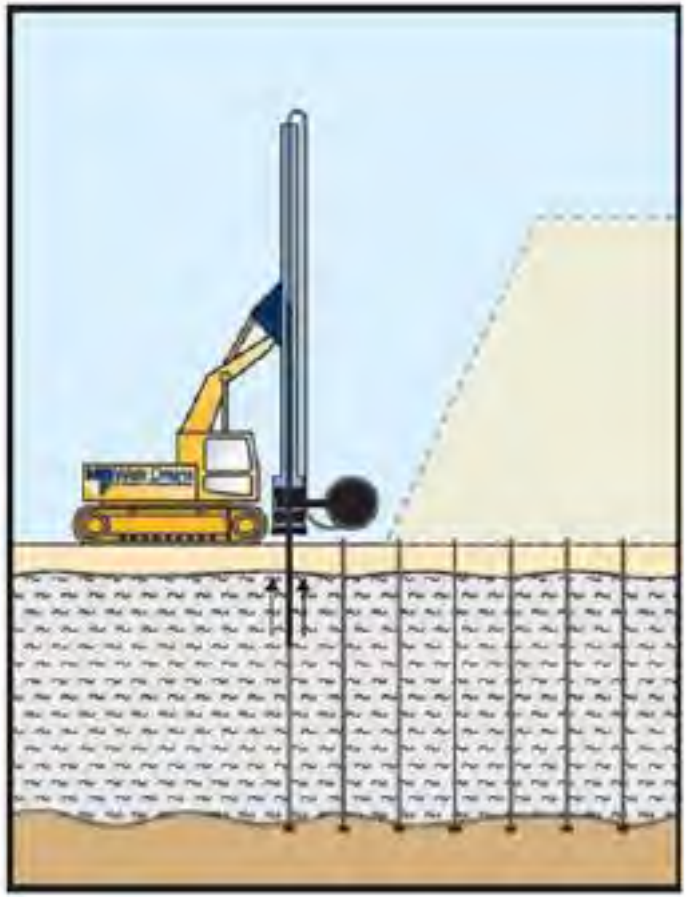
IR Site 17-Disposed Metal Parts Along Shoreline

IR Site 17 Background

- 1,000-ft stretch of shoreline located along the Mattawoman Creek in Indian Head, Maryland
- From the 1960s until the early 1980s, metals parts were discarded at the site, including shipping containers, empty drums, and motor casings
- Site 17 consists of two shallow groundwater plumes (North and South Plumes) with concentrations of TCE, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), and vinyl chloride (VC) above respective MCLs
- In 2012, in-situ chemical reduction via soil mixing was performed at the south plume. To date, no remedial activities have been performed at the North Plume, which is the focus of the Pilot Study.

Technology

- Installing closely-spaced (2-3 ft.) vertical conduits to shorten contaminant diffusion pathways in low permeability zones
- Improvement of delivery methods
- Creation of hundreds of vertical reaction zones to degrade Chlorinated Volatile organic compounds (CVOCs)
- Zero Valent Iron (ZVI) amendment has been shown to promote effective degradation of CVOCs in groundwater



Field Demonstration

- Install reaction columns on 2-ft by 2-ft centers in ~2,500 ft^2 treatment area, to a total depth of 30 ft
- ZVI and sand are batch-mixed on site and pumped to the stitcher for delivery into the subsurface
- Electrical resistivity imaging will verify emplacement of ZVI and track any changes in CVOC distribution
- Groundwater and soil vapor sampling from select reaction columns to quantify CVOCs and abiotic degradation products.

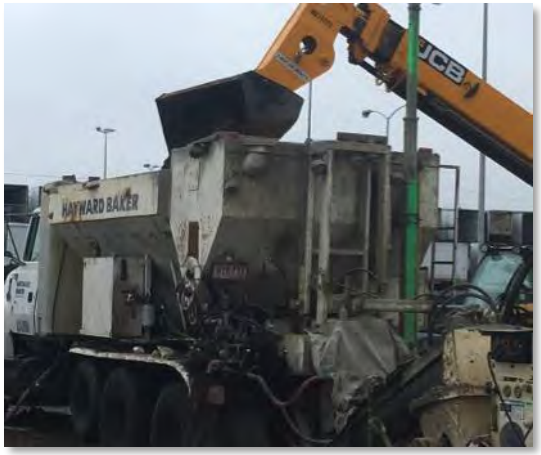
The "Bomber" Method

- The "Bomber" is a soil stabilization technology that delivers cement grout into subsurface voids
- Specialized equipment quickly injects grout into fill or natural soil via a direct push technique

100+ installs per day	**X**
Close spacing (2-3 ft)	**X**
Depths > 50 ft	**X**
Low costs (< $1 per foot)	**X**

The "Bomber" Method

How does it work?

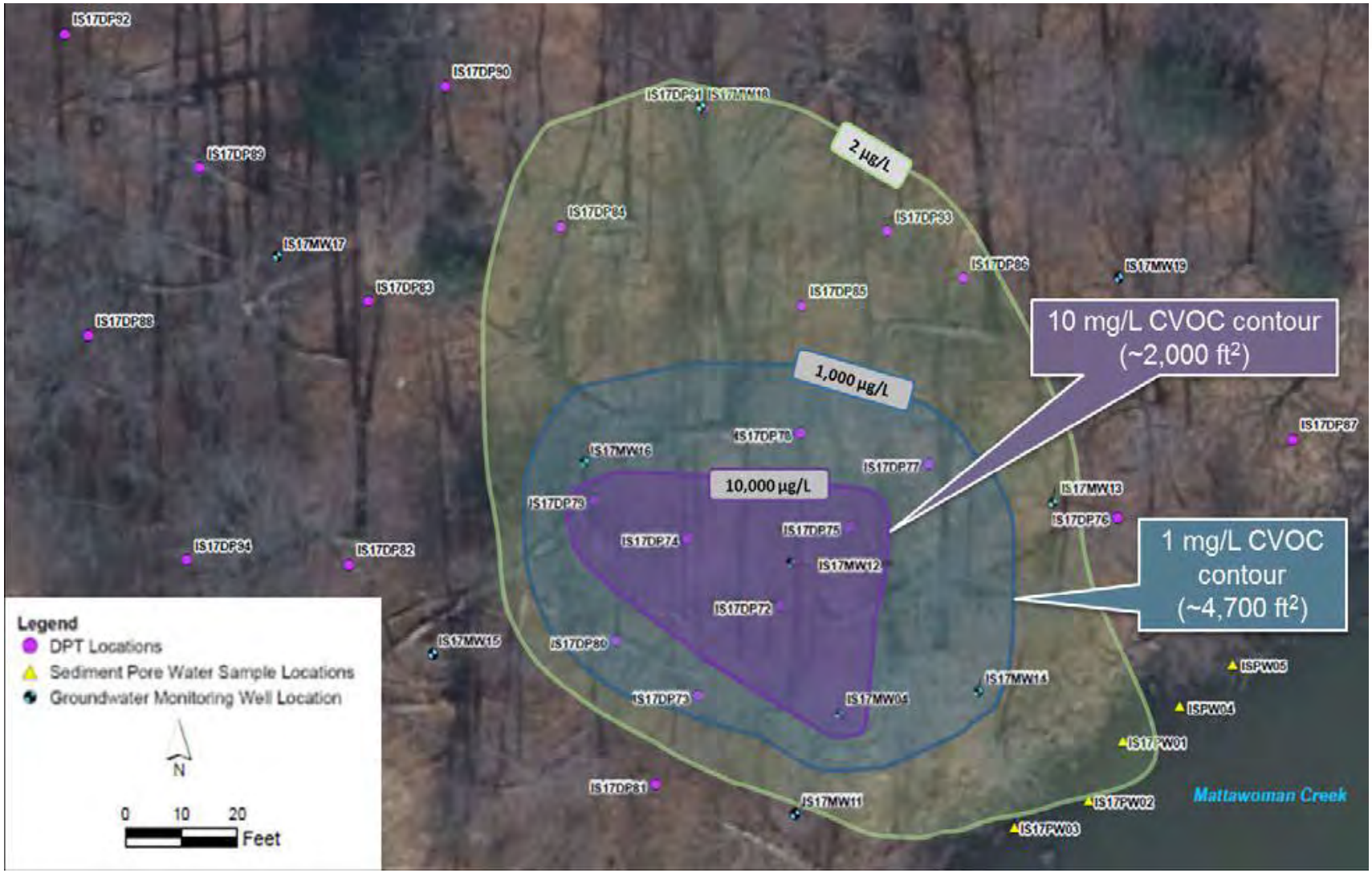


Batch-mix amendment ingredients in Elkin Mixer

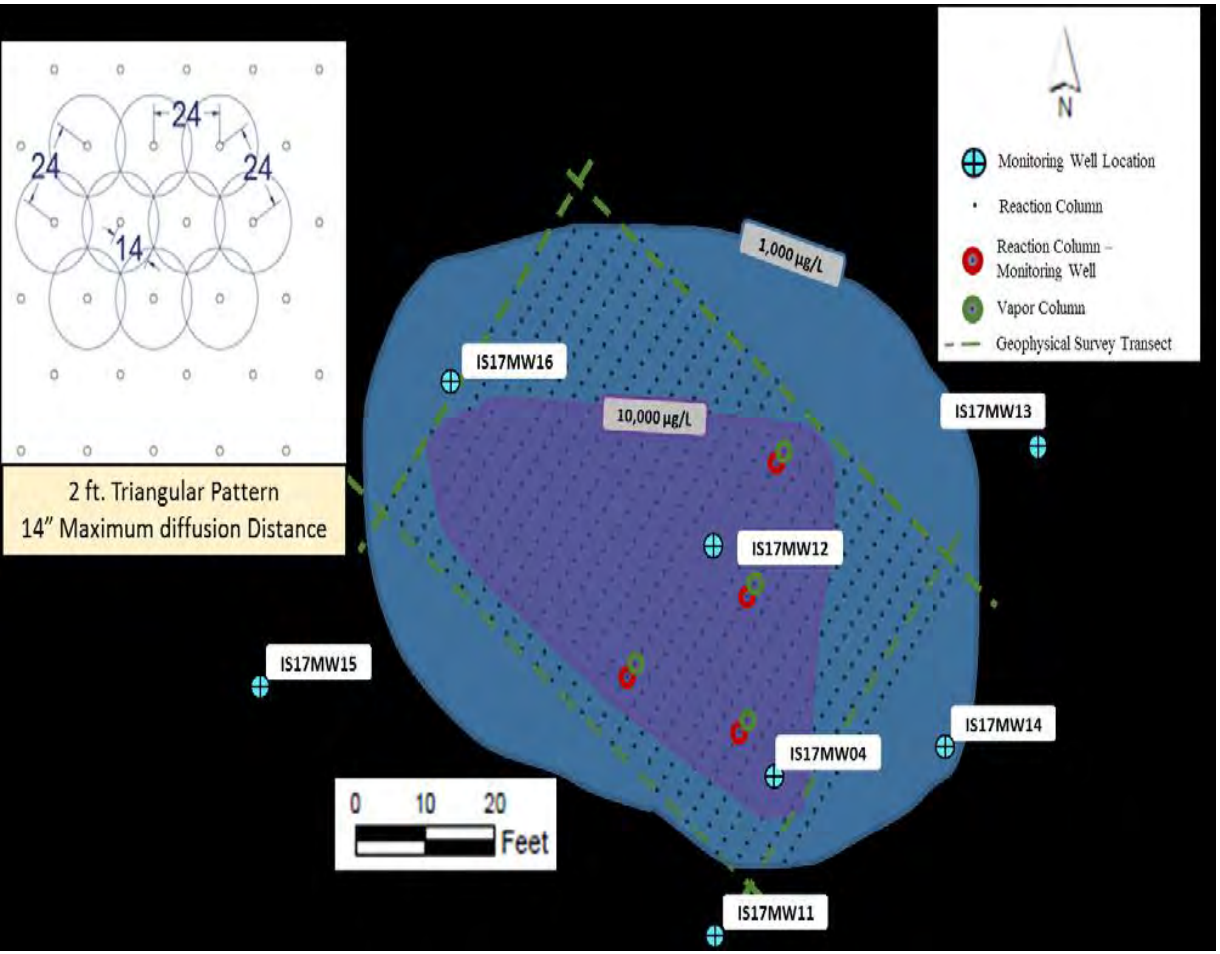
Deliver amendment into hopper and displacement pump

Pump amendment up mast and into mandrel for injection

IR Site 17 North Plume

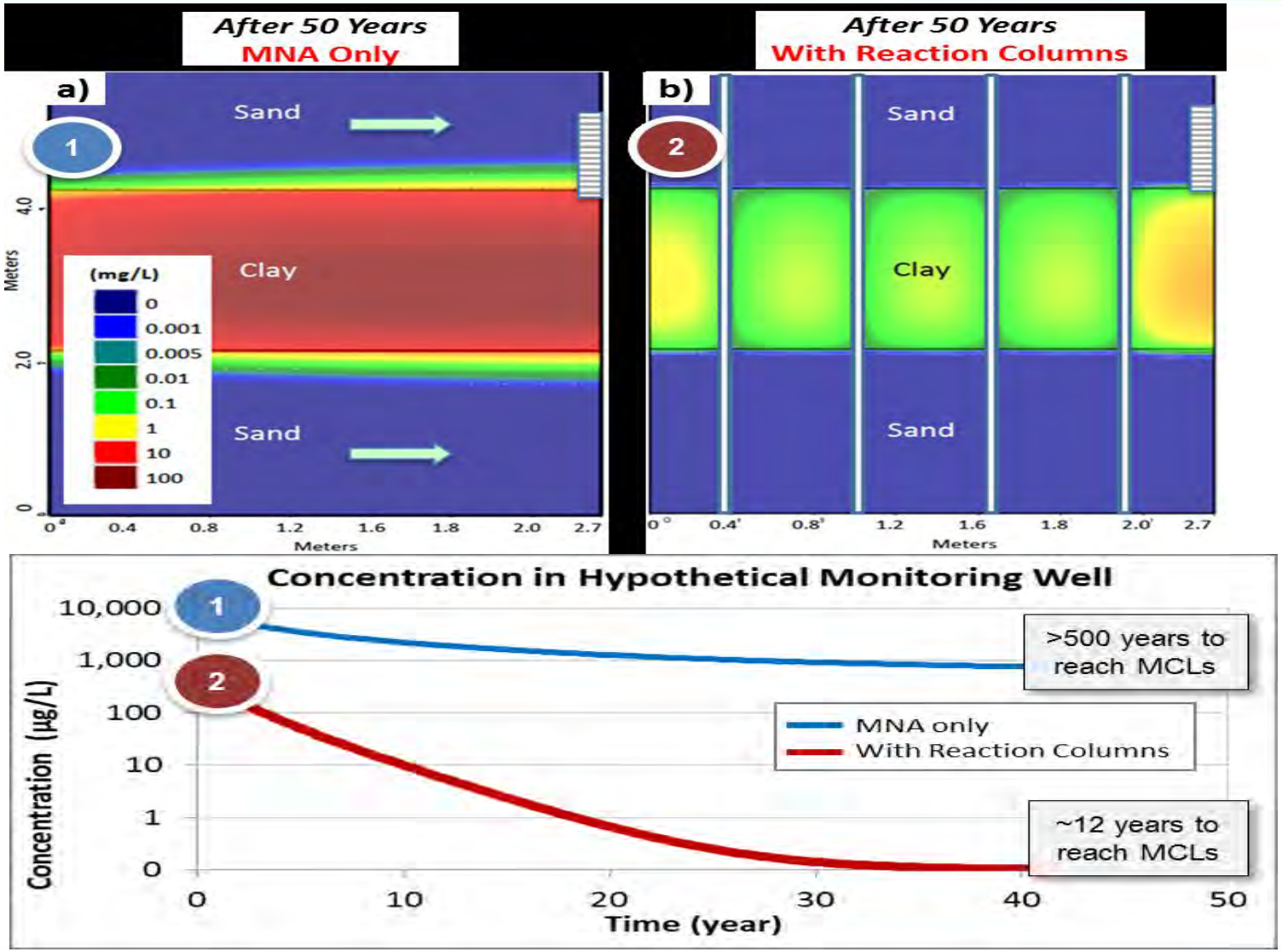


IR Site 17 North Plume



- **Install ~700 reaction columns to depth of 30 ft bgs using Bomber**
- **100+ holes per day**

IR Site 17 North Plume



Contacts and Questions

Points of Contact:

- **NAVFAC Washington:** Joseph Rail
- **NAVFAC Washington (Base RPM):** Andrew Louder

Questions ?

NSF INDIAN HEAD – SITE 57, PROTON-REDUCTION TECHNOLOGY PILOT TEST

Presented By
Alex Scott
Naval Facilities Engineering Command (NAVFAC)
Washington

05/02/2017

Presentation Objectives

Objective:

- Overview of the Site and Contaminants of Concern (COCs)
- Proton-Reduction Technology (PRT), and its application at the site.
- Summary of the results of the Pilot-Test performance monitoring.
- Path forward for the Site 57 Remedial Action Operations (RA-O).

Site 57 Overview

Building 292 Trichloroethene (TCE) Spill Site

Source Contamination History: use of TCE in vapor degreasing and general cleaning operations. TCE was transferred to drums, and stored on grassy areas outside, near the southern corner of the building.

Plume extends approximately 2,000 feet from Building 292, down Hershey Road, towards Building 436 and Mattawoman Creek.

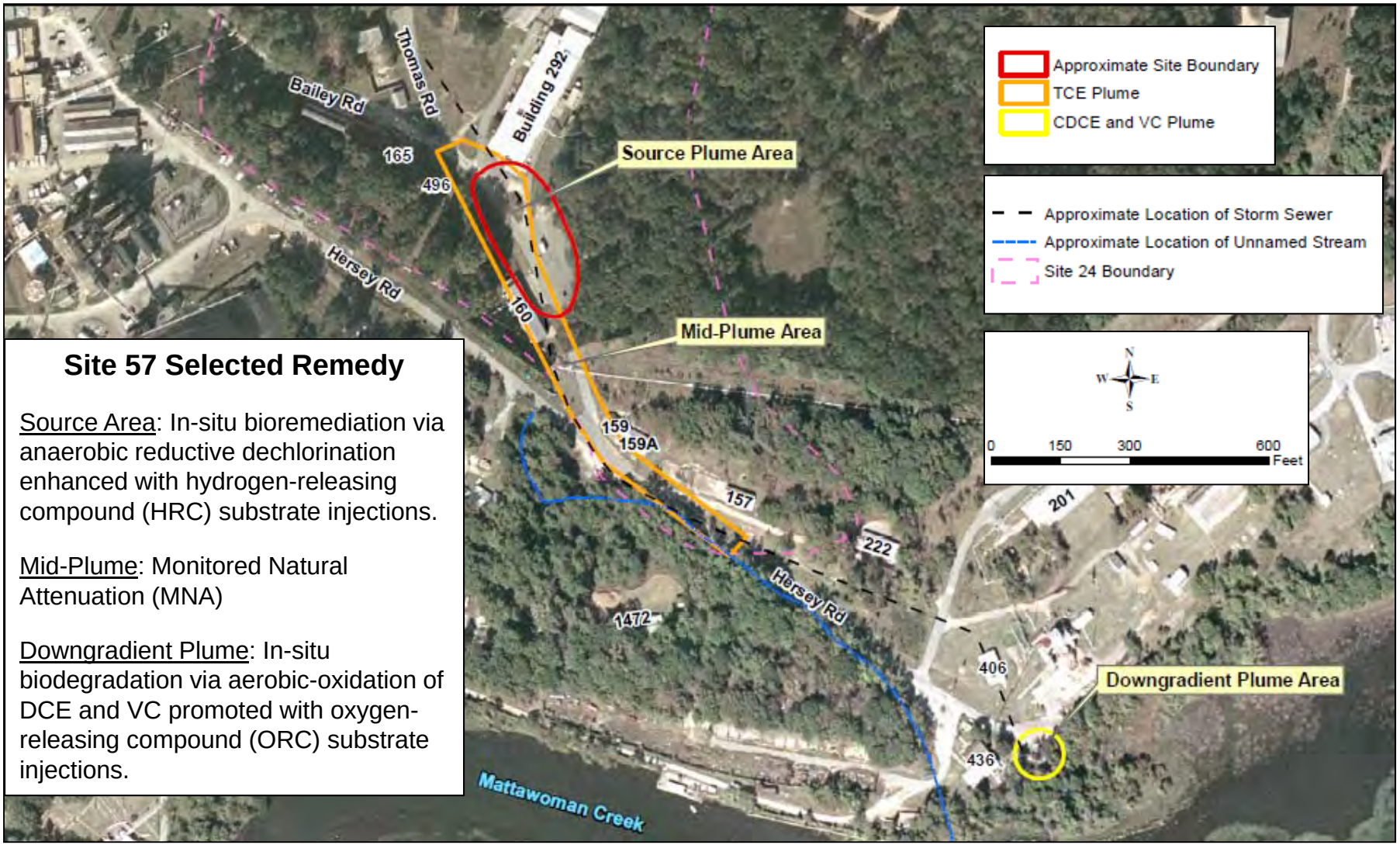
2011 Baseline Sampling demonstrated maximum contaminant concentrations of:

TCE - 1,000 µg/L in the Source Area and Mid-Plume Area

Cis-DCE – 2,600 µg/L in the Mid-Plume

VC – 380 µg/L in the downgradient plume

Site 57 Overview



Site 57 Selected Remedy

Source Area: In-situ bioremediation via anaerobic reductive dechlorination enhanced with hydrogen-releasing compound (HRC) substrate injections.

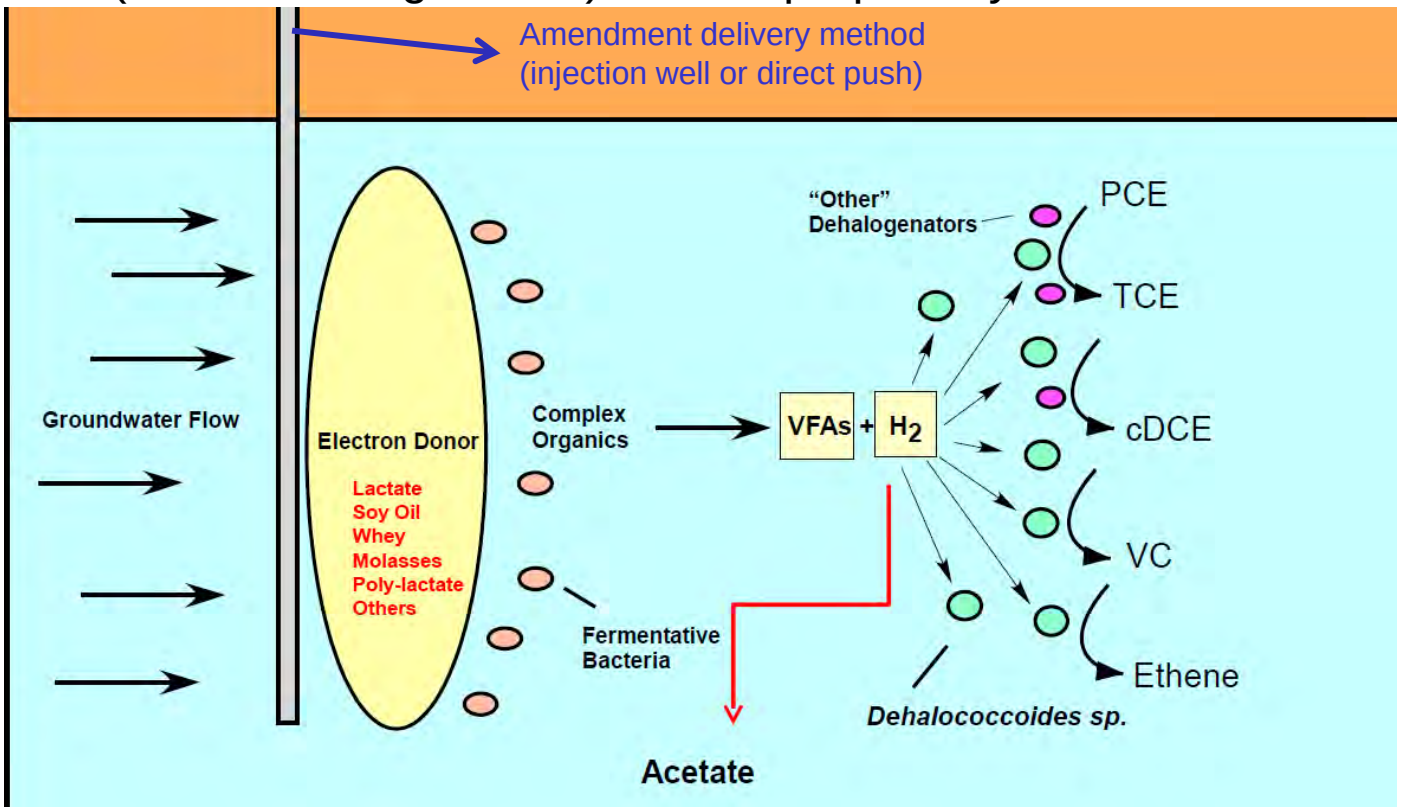
Mid-Plume: Monitored Natural Attenuation (MNA)

Downgradient Plume: In-situ biodegradation via aerobic-oxidation of DCE and VC promoted with oxygen-releasing compound (ORC) substrate injections.

Site 57 Overview (Plume Areas)

Site 57 PRT Technology Overview

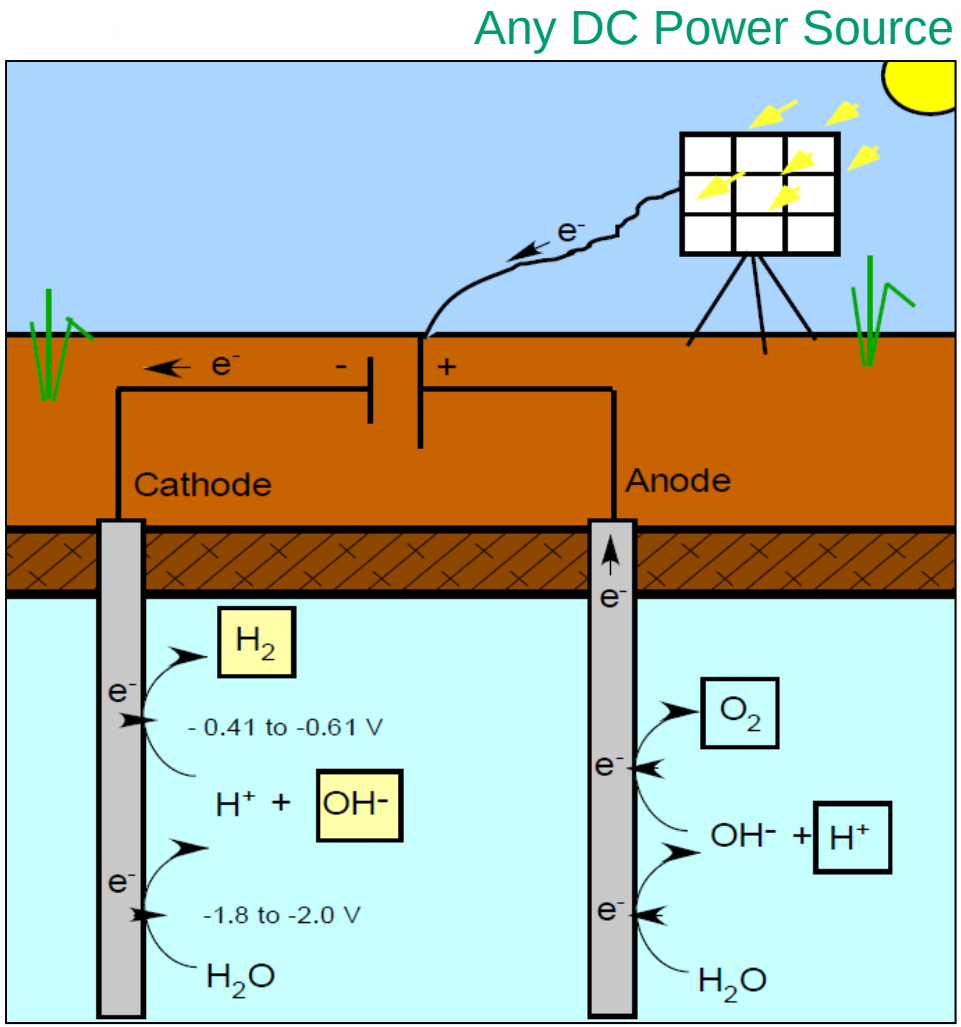
The Proton Reduction Technology (PRT) is used to continue promotion of anaerobic reductive degradation of chlorinated VOCs (CVOCs). Conceptually, in-situ reductive degradation requires a source (electron donors, usually edible oils) of electrons (usually resulting in “free” hydrogen and volatile fatty acids [VFAs]) to initiate biotic dechlorination (a.k.a. dehalogenation). PRT is proprietary to CB&I, Inc.



Site 57 PRT Technology Overview

Proton (H^+) reduction occurs when electrons are transferred to hydrogen ions at a charged cathode surface.

- Requires low voltage (approx. 0.5 V)
- Transfers an electron to the hydrogen ion (H^+) generating atomic H_2 (2 electrons [e^-] available) at cathodic end.
- Therefore Hydrogen is able to donate electrons towards reductive bioremediation in the vicinity of the cathode.
- Electrons are scavenged from the anode.
- Can create localized increases in acidity (lower pH) and oxygen. Sites may need pH buffering (increase in pH) to compensate.



Site 57 PRT Implementation

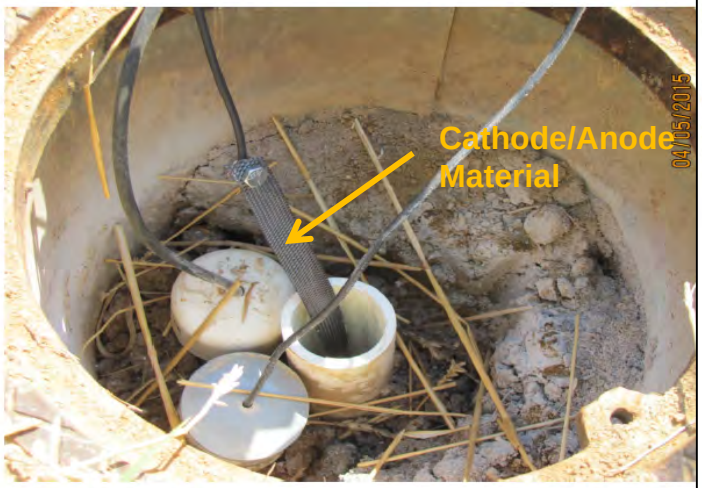
PRT Implementation Timeline

- **2015, March** – Pre-PRT pilot test installation sampling.
- **2015, April to May** – Installation of PRT anodes and cathodes, and system infrastructure.
- **2015, July** – pH buffering solution applied to aquifer, and sample collected
- **2015, September** – Amendment injections at injection wells (IWs).
- **2015, October** – PRT system startup and begin quarterly sampling.
- **2016, July** – Last performance monitoring sample collected.

Site 57 PRT Site Application

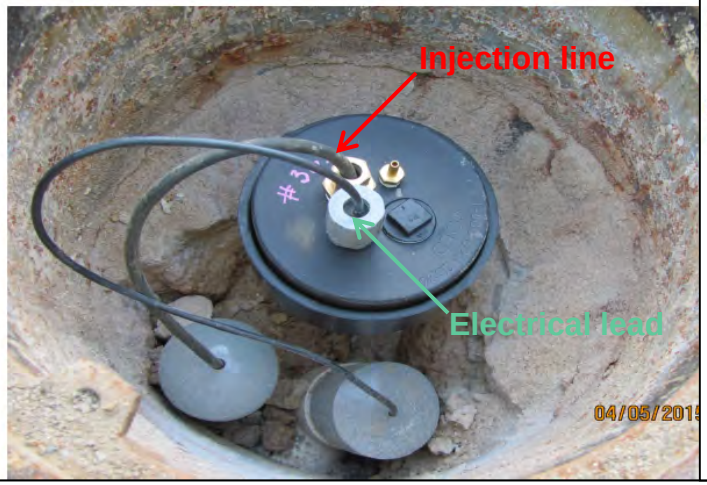
Photograph 9:

Description:
Cathode installation at injection wellhead



Photograph 10:

Description:
Completed injection wellhead



Photograph 5:

Description:
Excavation for conduit

Photograph 6:

Description:
Conduit installation

Site 57 PRT Site Application

Photograph 15:

PRT Control Panel

Photograph 12:

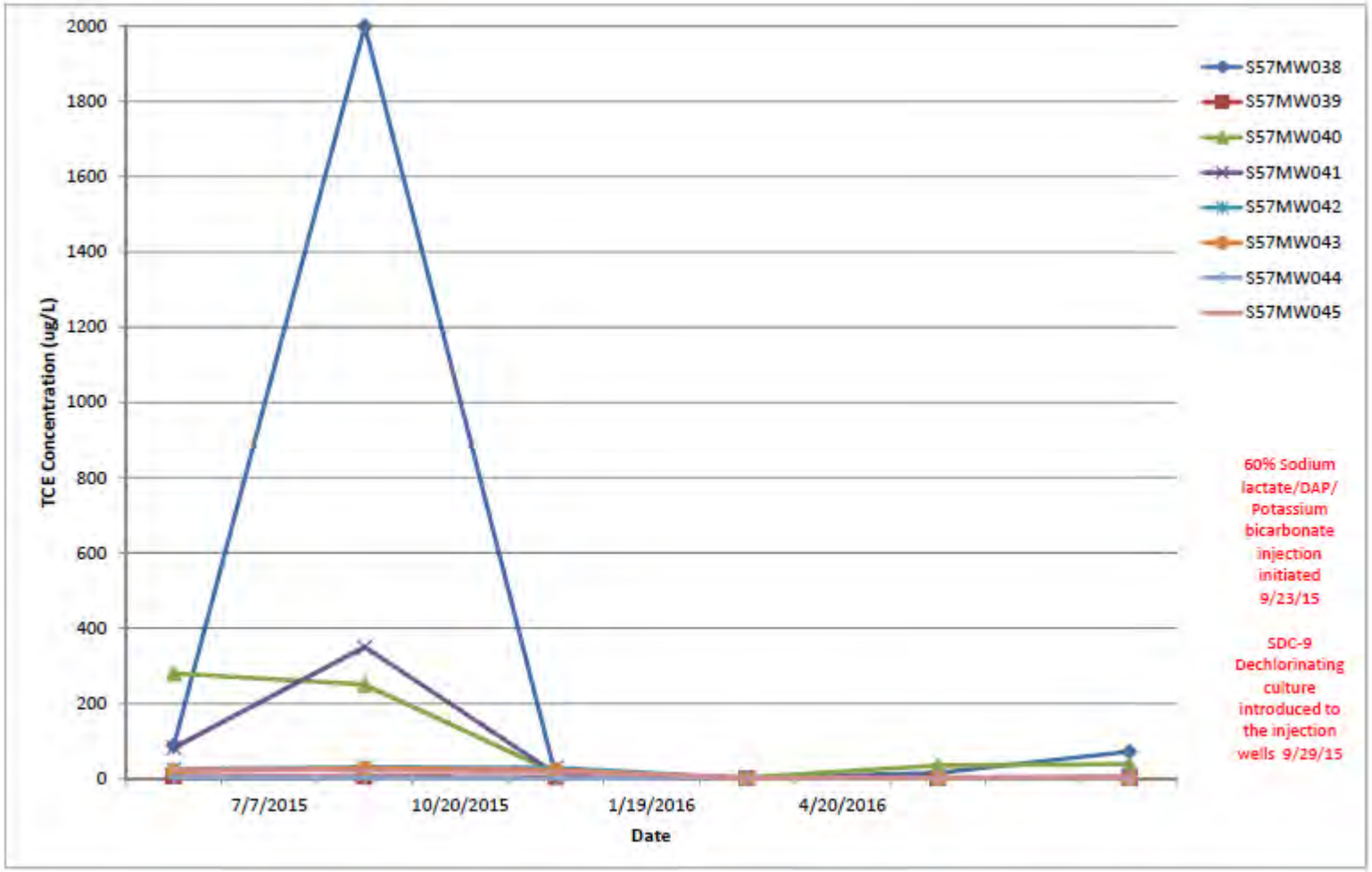
Description:
Installed injection system panel

Photograph 21:

Description:
Injection of SDC-9 culture

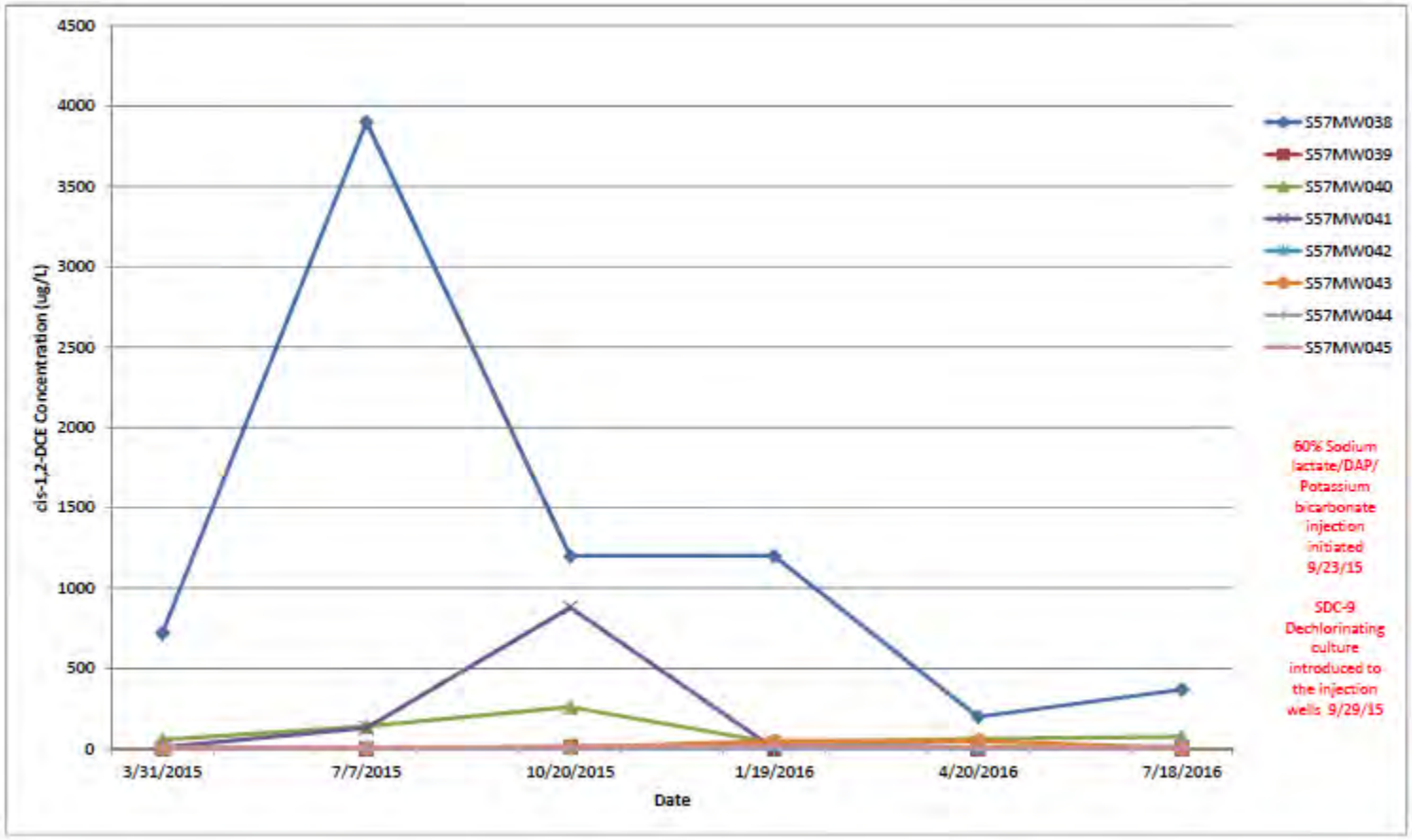
Site 57 PRT Performance

TCE Trends



Site 57 PRT Performance

Cis-1,2 DCE Trends



Site 57 PRT Performance Conclusions

Conclusions:

- The PRT did not appear to affect the performance of bioremediation degradation. Note the trends after 10/20/2015.
- Observed reductions in COCs were primarily due to amendment injections of buffer, lactate, and possibly the SD-9 culture.
- The PRT did not appear to significantly affect aquifer conditions as detected in monitoring wells. There may have been some slight lowering of pH near IWs. However, the observed lowering of dissolved oxygen or measured oxidation-reduction potential (ORP), which indicates an anaerobic environment conducive to biotic reductive-dechlorination were primarily due to increased microbial activity attributed to amendment injections rather than the application of PRT.

Contacts and Questions

Points of Contact:

- **NAVFAC Washington RPM:** Alex Scott
- **Indian Head PM:** Andrew Louder

Questions ?

NSF INDIAN HEAD – FIVE YEAR REVIEW UPDATE

Presented By
Alex Scott
Naval Facilities Engineering Command (NAVFAC)
Washington

05/02/2017

Presentation Objectives

Objectives:

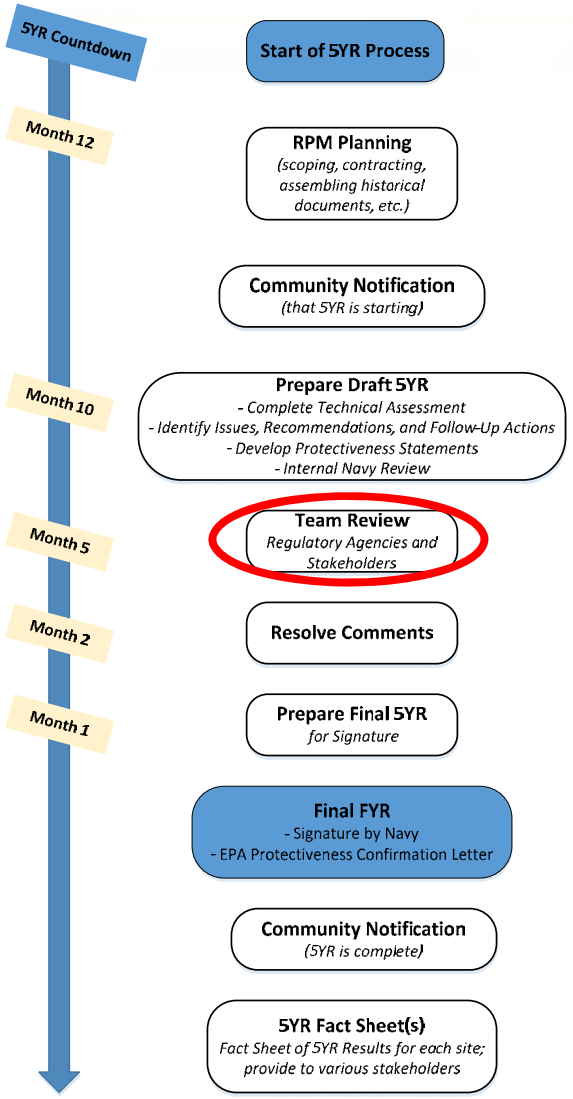
- Present a brief overview of the Five-Year Review (5YR) process for Navy Environmental Restoration (ER,N) sites at NSF Indian Head (NSFIH)
- Update site statuses based on the **Draft** 2017 5YR document, pending regulatory review and acceptance.

Note: 5YR site summaries were presented during the October 2016 RAB meeting. That presentation, meeting minutes, public documents in the administrative record, and the NSFIH Site Management Plan are locatable at the ER,N NSFIH Public Website:

http://go.usa.gov/DyQF

5YR Process

- A 5YR occurs at sites that have a record of decision (ROD) that implement a selected remedy at a site to address contamination per the 1980 Comprehensive Environmental Response Compensation and Liability Act (CERCLA).
- 5YR is required for sites with remedial action that does not (or does not yet) allow for unlimited use and unrestricted exposure (UU/UE), per CERCLA §121, as amended.
- Ultimate 5YR outcome is protectiveness determination for human health and the environment for each site/remedy, per EPA (2001) 5YR Comprehensive Guidance:
  - ✓ Protective
  - ✓ Will Be Protective
  - ✓ Protective in the Short-Term
  - ✓ Not Protective
  - ✓ Protectiveness Deferred
- Indian Head's next 5YR process is underway and expected to be completed by the end of September 2017



The 5YR and CERCLA

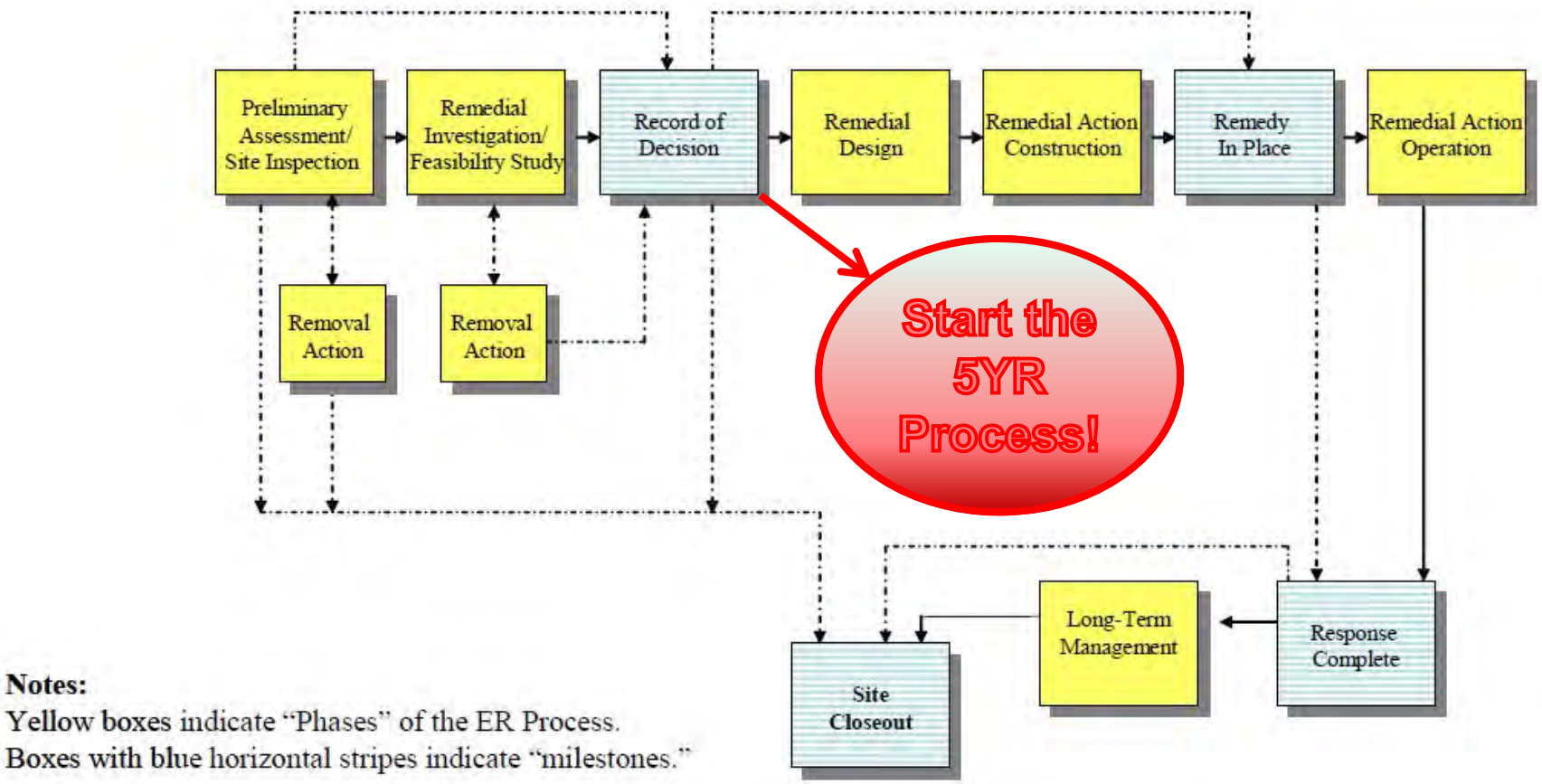


Figure 5-1. DON Environmental Restoration Process – Phases and Milestones

- Navy Environmental Restoration Program (NERP) Manual, 2006

2017 Draft 5YR Update

The Draft 5YR results answer the following:

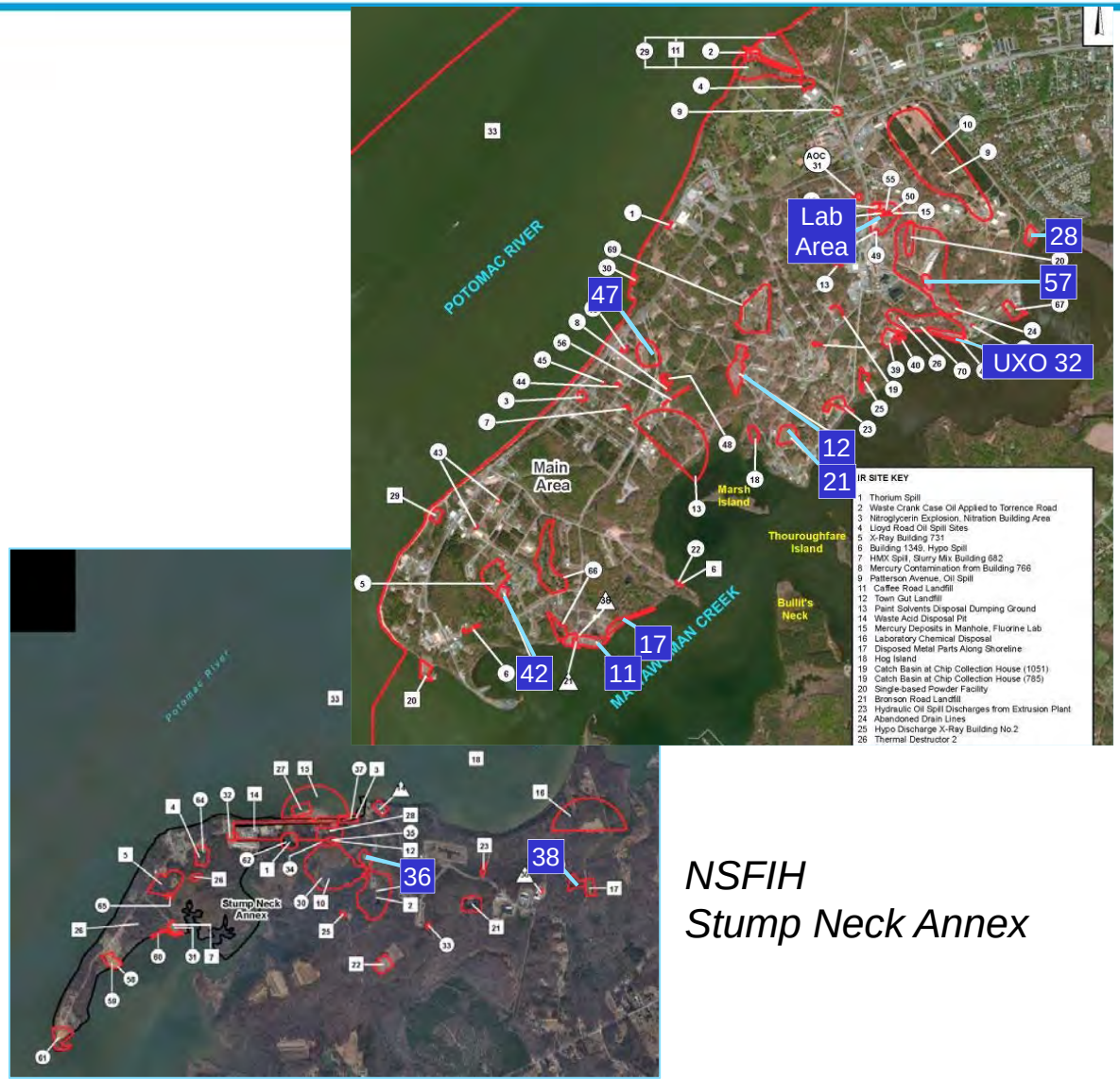
- **Question A (Implementation & Performance):**
  Is the Selected Remedy functioning as intended per the ROD?
- **Question B (Data Review):**
  Are the exposure assumptions, toxicity data, and remedial action objectives (RAOs) used at the time of the remedy selection and ROD still valid?
- **Question C (Protectiveness Statement):**
  Has any other information come to light that calls into question the protectiveness of the selected remedy?

From the 5YR Technical Assessment Questions (EPA, 2001)

12 Sites for the 2017 5YR

- **Site 11** – Caffee Road Landfill
- **Site 12** – Town Gut Landfill
- **Site 17** – Disposed Metal Parts Along Shoreline
- **Site 21** – Bronson Road Landfill
- **Site 28** – Original Burning Ground
- **Site 36** – Closed Landfill
- **Site 38** – Rum Point Landfill
- **Site 42** – Olsen Road Landfill
- **Site 47** – Mercuric Nitrate Disposal Area
- **Site 57** – TCE Building 292 Area
- **Lab Area** (Sites 14, 15, 16, 49, 50, 53, 54, and 55)
- **UXO 32** – Scrap Yard (formerly IRP Site 41)

Site Locations



NSFIH
Main Area

NSFIH
Stump Neck Annex

U.S. Navy

Site 11 – Caffee Road Landfill

Site 11 – Caffee Road Landfill

2017 5YR Draft Update

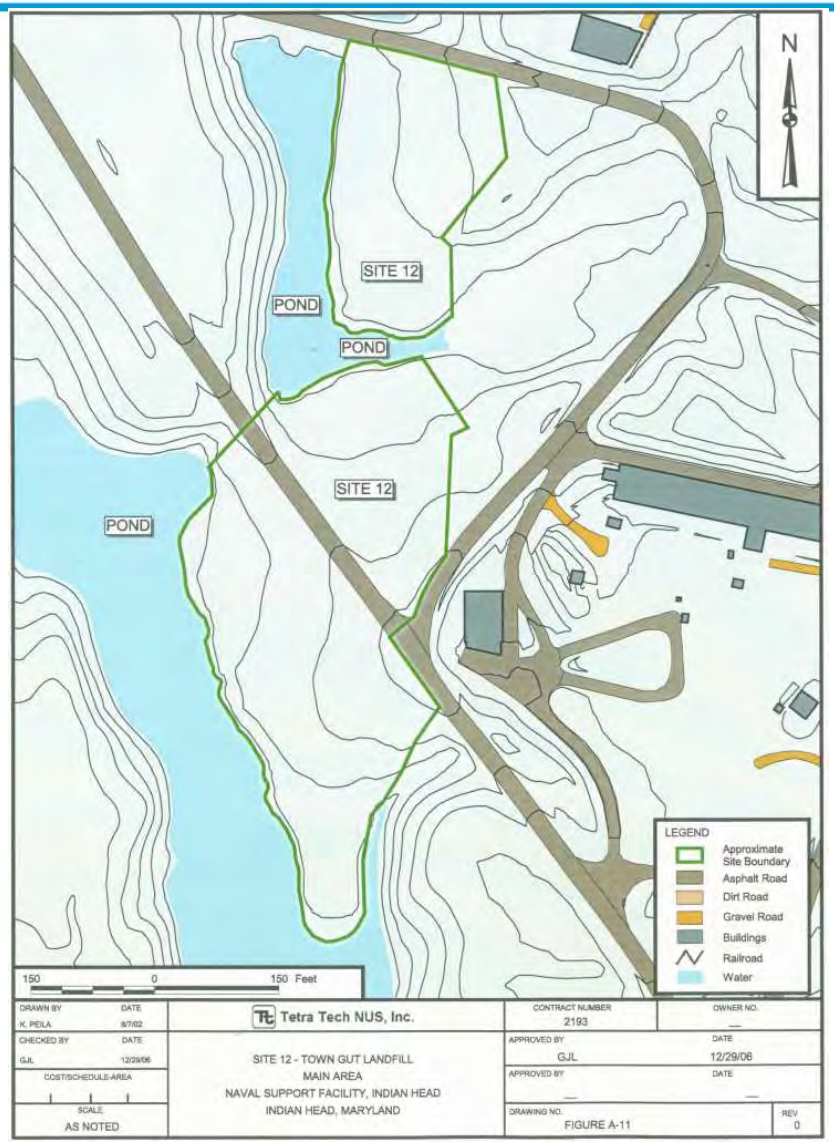
Implementation & Performance: Remedy has been implemented as described in the ROD, and is and is functioning as intended.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: Contaminant concentrations demonstrate decreasing or no trend. Contaminant concentrations continue to exceed background levels, and the EPA's Maximum Contaminant Levels (MCLs), which is the maximum allowable amount of a contaminant in drinking water.

Selected Remedy: Landfill with protective soil cover. Shoreline stabilization. Land-Use controls (LUCs). Groundwater Monitoring.

Site 12 – Town Gut Landfill



Site 12 – Town Gut Landfill

2017 5YR Draft Update

Implementation & Performance: Remedy has been implemented as described in the ROD, and is and is functioning as intended.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: Contaminant concentrations demonstrate decreasing or no trend. Contaminant concentrations continue to exceed background levels and MCLs.

Selected Remedy: 2002 Interim-Removal Action (IRA) removed waste and regraded the area. A landfill protective soil cover was placed over remaining wastes. Land-Use controls (LUCs). Groundwater and Surface Water Monitoring.

Site 17 – Disposed Metal Parts Along Shoreline

Site 17 – Disposed Metal Parts Along Shoreline

2017 5YR Draft Update

Implementation & Performance: Remedy has been implemented as described in the ROD in the south plume area. However, recently discovered site conditions in the north plume area contain high levels of contaminant concentrations and is currently being evaluated to implement remediation technologies.

Protectiveness: Remedy will be protective of human health and the environment. Exposure pathways that could result in unacceptable risk will be controlled. The currently operating remedy and NSFIH institutional controls (ICs) are protective of human health and the environment in the short-term.

Data Evaluation: Contaminant concentrations demonstrate decreasing or no trend in the south plume area. Contaminant concentrations continue to exceed background levels, and MCLs. An insufficient number of samples in the north plume area have been collected to provide a meaningful trend analysis. Environmental monitoring indicates that contamination is not migrating and/or threatening exposure to unacceptable risks.

Selected Remedy: Clearing and removal of munitions. Treatment of the aquifer with zero-valent iron (ZVI) to chemically-reduce aquifer contamination in-situ (in place). Groundwater monitoring and LUCs.

Site 21 – Bronson Road Landfill

Site 21 – Bronson Road Landfill

2017 5YR Draft Update

Implementation & Performance: Remedy has been implemented as described in the ROD, and is functioning as intended.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: The majority of contaminant concentrations demonstrate decreasing or no trend. Contaminant concentrations continue to exceed background levels and MCLs.

Selected Remedy: Landfill protective soil cover, LUCs, and groundwater monitoring.

Site 28 – Original Burning Ground

Site 28 – Original Burning Ground

2017 5YR Draft Update

Implementation & Performance: Remedy has been implemented as described in the ROD, except for implementing the Long-Term Monitoring and Management (LTM) plan. LTM sampling results will demonstrate the remedy's long-term protectiveness and if the remedy is performing as intended.

Protectiveness: Remedy will be protective of human health and the environment. Exposure pathways that could result in unacceptable risk will be controlled. The currently operating remedy and NSFIH ICs are protective of human health and the environment in the short-term.

Data Evaluation: Groundwater monitoring is being implemented.

Selected Remedy: 2008 IRA addressed soil sediment contaminant risks. Groundwater remedy consists of monitoring and LUCs.

Site 36 – Closed Landfill

Site 36 – Closed Landfill

2017 5YR Draft Update

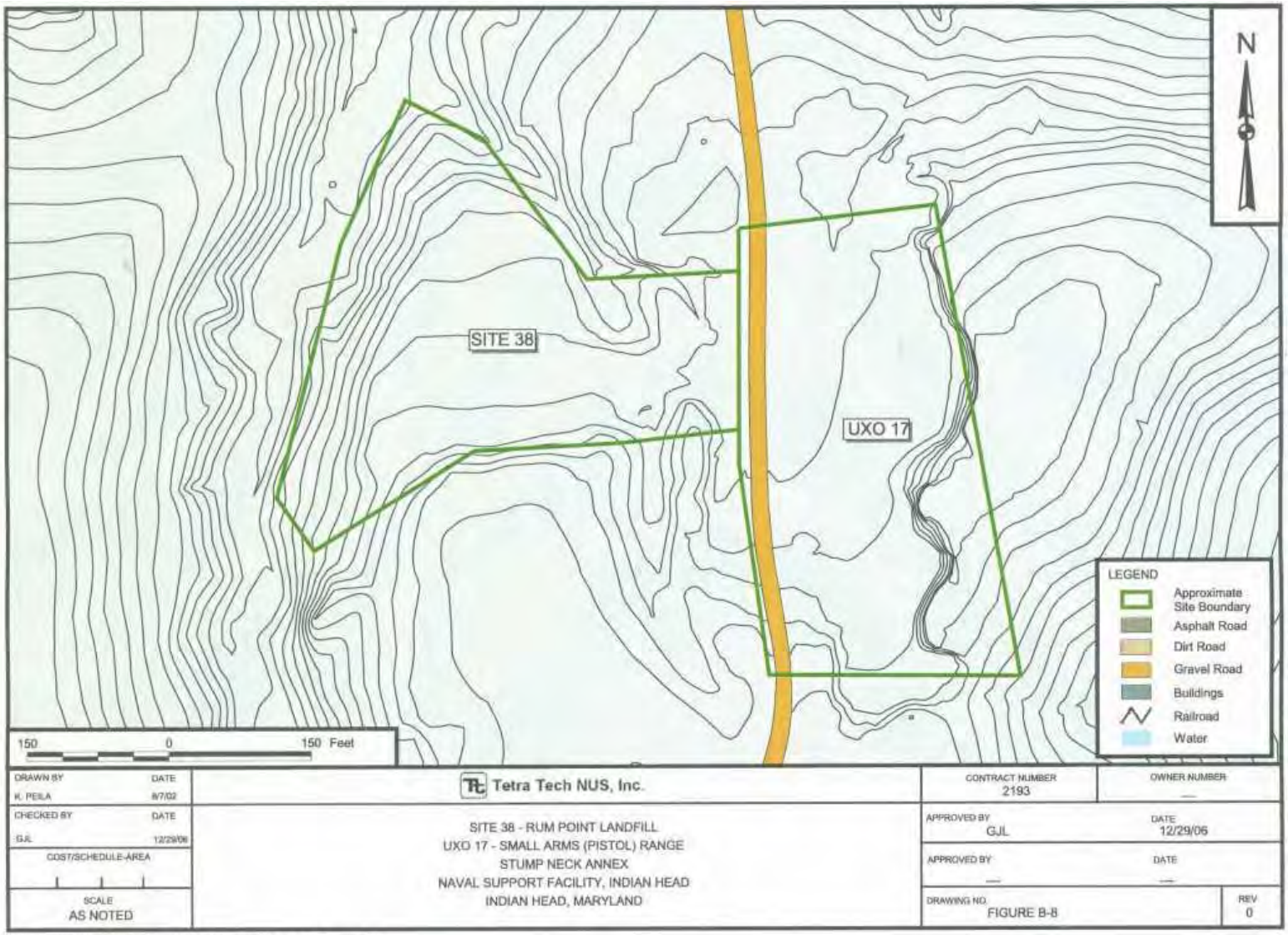
Implementation & Performance: Remedy has been implemented as described in the ROD, and is functioning as intended.

Protectiveness: Remedy will be protective of human health and the environment. Exposure pathways that could result in unacceptable risk will be controlled. The currently operating remedy and NSFIH ICs are protective of human health and the environment in the short-term.

Data Evaluation: There are insufficient rounds of monitoring data to determine a meaningful trend in the data. Future LTM results will verify the remedy's protectiveness and protectiveness.

Selected Remedy: Removal of large metal debris along shoreline. Maintenance of existing landfill protective soil cover, LUCs, and groundwater monitoring.

Site 38 – Rum Point Landfill



Site 38 – Rum Point Landfill

2017 5YR Draft Update

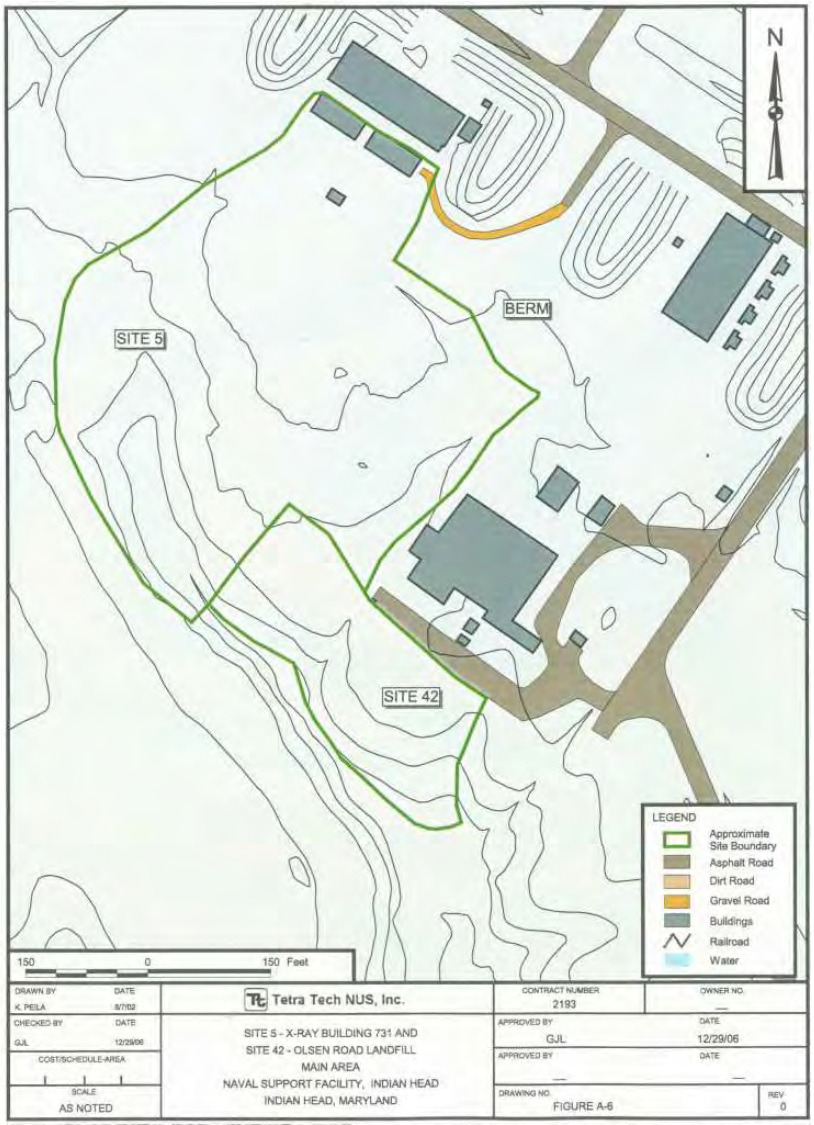
Implementation & Performance: Remedy is currently being implemented as described in the ROD.

Protectiveness: Remedy will be protective of human health and the environment. Exposure pathways that could result in unacceptable risk will be controlled. The current implementation of the remedy and NSFIH ICs are protective of human health and the environment in the short-term.

Data Evaluation: Monitoring data is pending the completion of the remedial action, including the installation of monitoring wells and finalization of a LTM plan.

Selected Remedy: Landfill waste removal. Post removal groundwater monitoring, interim LUCs until removal completed. Anticipated that all soil contamination will be removed.

Site 42 – Olsen Road Landfill



Site 42 – Olsen Road Landfill

2017 5YR Draft Update

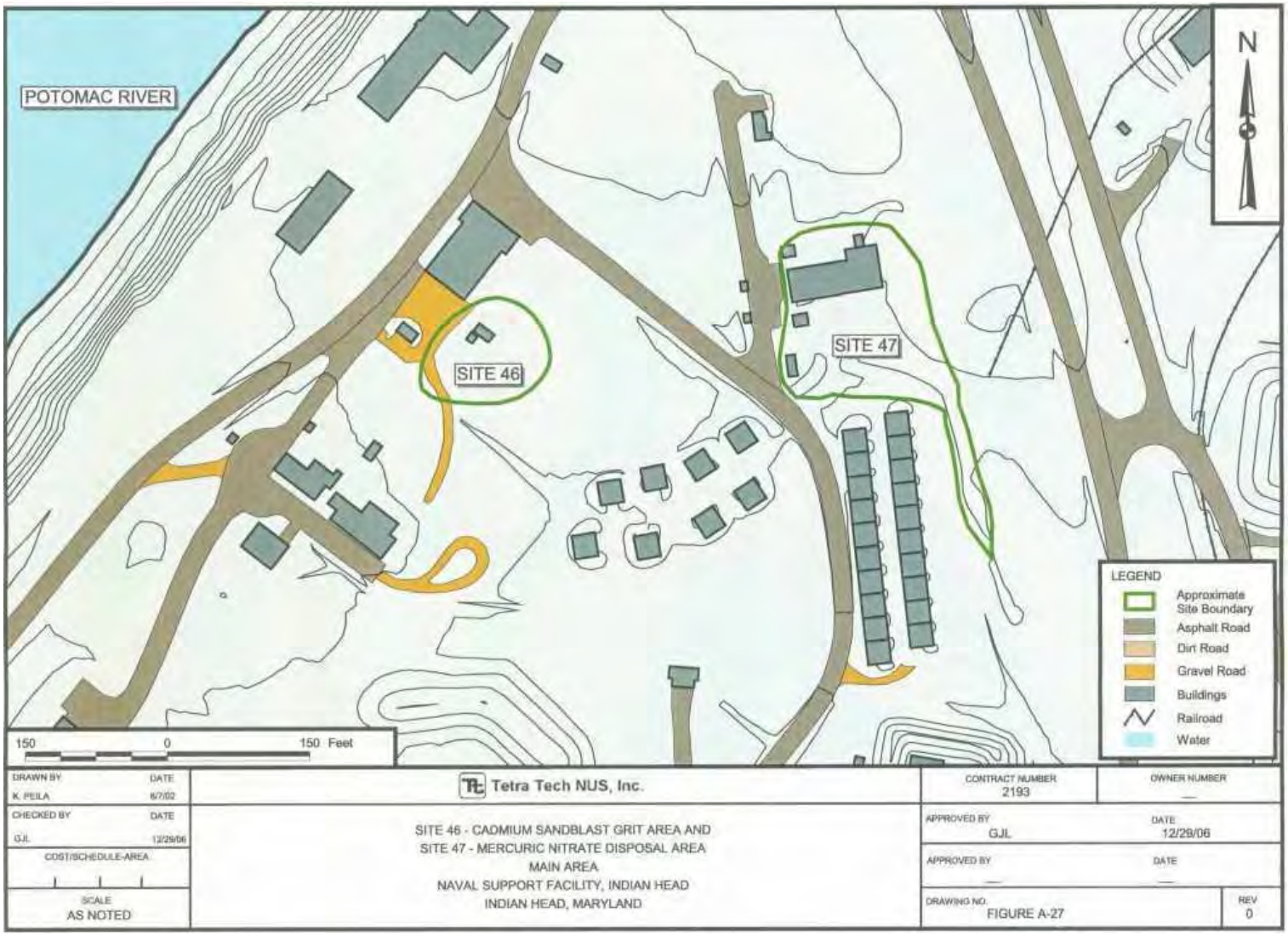
Implementation & Performance: Remedy has been implemented as described in the ROD, and is functioning as intended.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: The majority of contaminant concentrations demonstrate decreasing or no trend. Contaminant concentrations continue to exceed background levels and MCLs. There is an increasing TCE concentration trend noticed in one monitoring well. However, this contaminant does not appear to be migrating off-site.

Selected Remedy: Wetlands construction and engineered cap. Excess wastes removed. Groundwater and surface water monitoring.

Site 47 – Mercuric Nitrate Disposal Area



Site 47 – Mercuric Nitrate Disposal Area

2017 5YR Draft Update

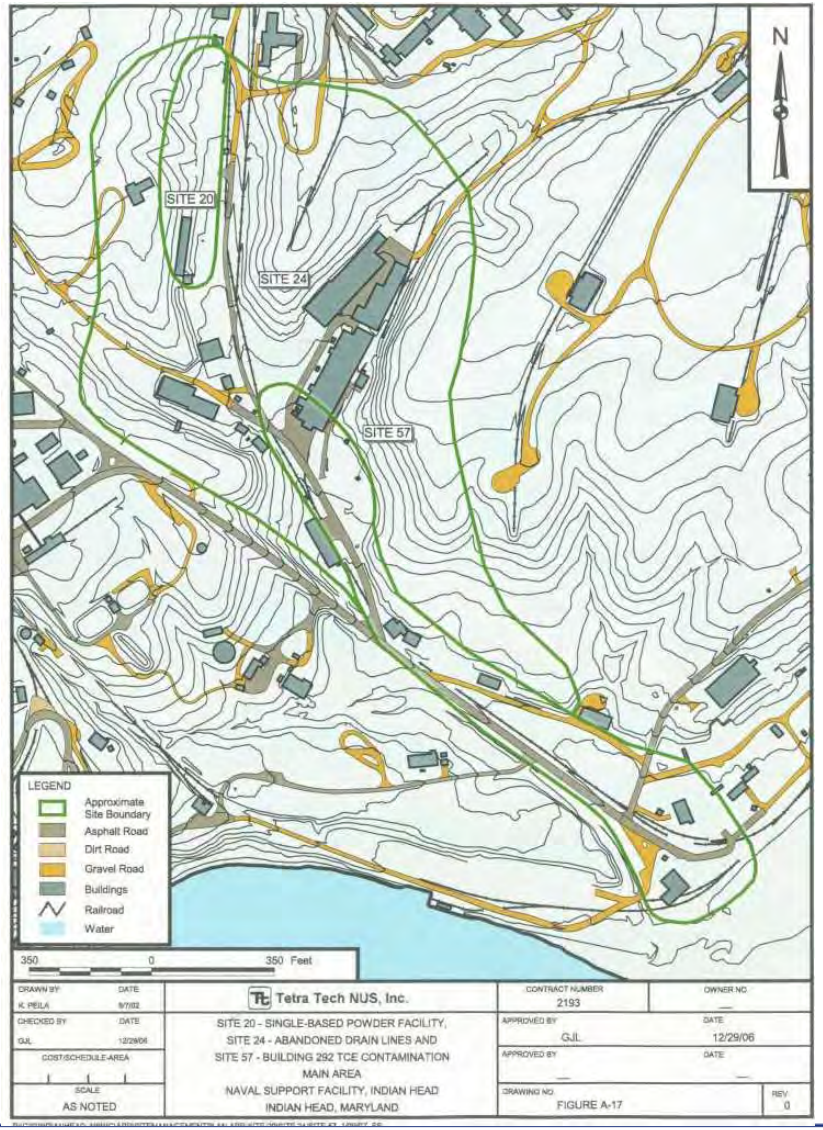
Implementation & Performance: Remedy has been implemented as described in the ROD, and is functioning as intended. However, high levels of carbon-tetrachloride persist in the source area, and may not achieve performance goals.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: The majority of contaminant concentrations demonstrate decreasing or no trend. Contaminant concentrations continue to exceed background levels and MCLs. Persistent high concentrations of carbon-tetrachloride in the source area is currently being evaluated for further remediation to improve remedy performance.

Selected Remedy: In-situ chemical oxidation using alkaline-activated sodium persulfate (AAP) and catalyzed hydrogen peroxide. Groundwater monitoring and LUCs.

Site 57 – Building 292 TCE Contamination



Site 57 – Building 292 TCE Contamination

2017 5YR Draft Update

Implementation & Performance: Remedy has been implemented as described in the ROD. However the site's groundwater conditions differ from the intended function described in the ROD. Additionally, persistent exceedances of trichloroethene (TCE) indicate that remedy performance may not be what was predicted in the ROD.

Protectiveness: Remedy will be protective of human health and the environment. Exposure pathways that could result in unacceptable risk will be controlled. The currently operating remedy and NSFIH ICs are protective of human health and the environment in the short-term.

Data Evaluation: The majority of contaminant concentrations demonstrate decreasing or no trend. Contaminant concentrations continue to exceed background levels and MCLs. A recent pilot study was conducted to determine if there was an effective source area treatment. Although the technology itself was not promising, the use of amendment injections during the pilot study did demonstrate effective reductions in contaminant concentrations. The site is currently being evaluated for remedy optimization to improve performance.

Selected Remedy: In-situ bioremediation in the upper (source area) TCE plume by anaerobic reductive-dechlorination (electron donor) enhanced with substrate injections of Hydrogen Release Compound (HRC) directly into the surficial aquifer. This would form a "reactive barrier", so the subsequent middle plume would continue to address degradation of the TCE via natural attenuation.

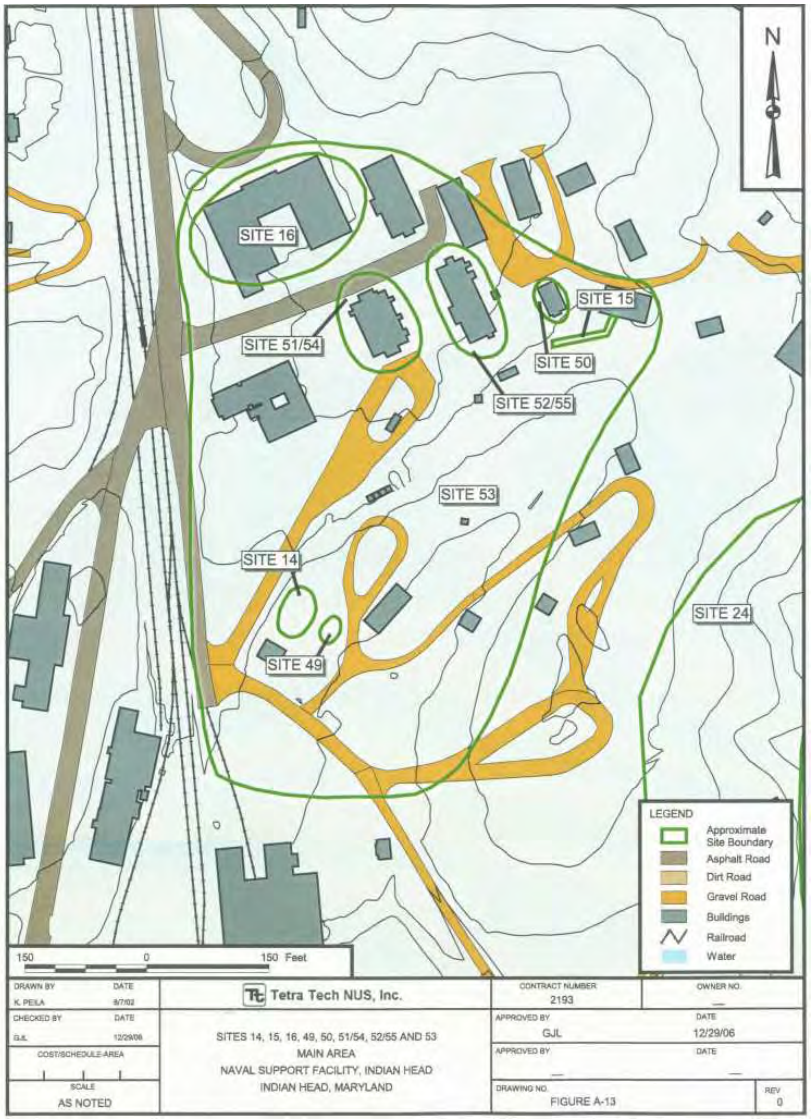
In-situ bioremediation in the downgradient plume with substrate injections of the Oxygen Release Compound (ORC) electron acceptor to achieve aerobic treatment of the breakdown products dichloroethene (DCE) and vinyl chloride (VC). Presently, the groundwater conditions in this area have reverted to anaerobic and reductive conditions, which differ from what was prescribed in the ROD.

Groundwater monitoring and LUCs in the long-term.

Lab Area

The Lab Area lumps the following sites together under one selected remedy:

- **Site 14** - Waste Acid Disposal Pit
- **Site 15** - Mercury Deposits in Manhole, Fluorine Lab
- **Site 16** - Laboratory Chemical Disposal
- **Site 49** - Chemical Disposal Pit
- **Site 50** - Building 103, Crawl Space
- **Site 53** - Mercury Contamination of the Sewage System
- **Site 54** - Building 101
- **Site 55** - Building 102



Lab Area

2017 5YR Draft Update

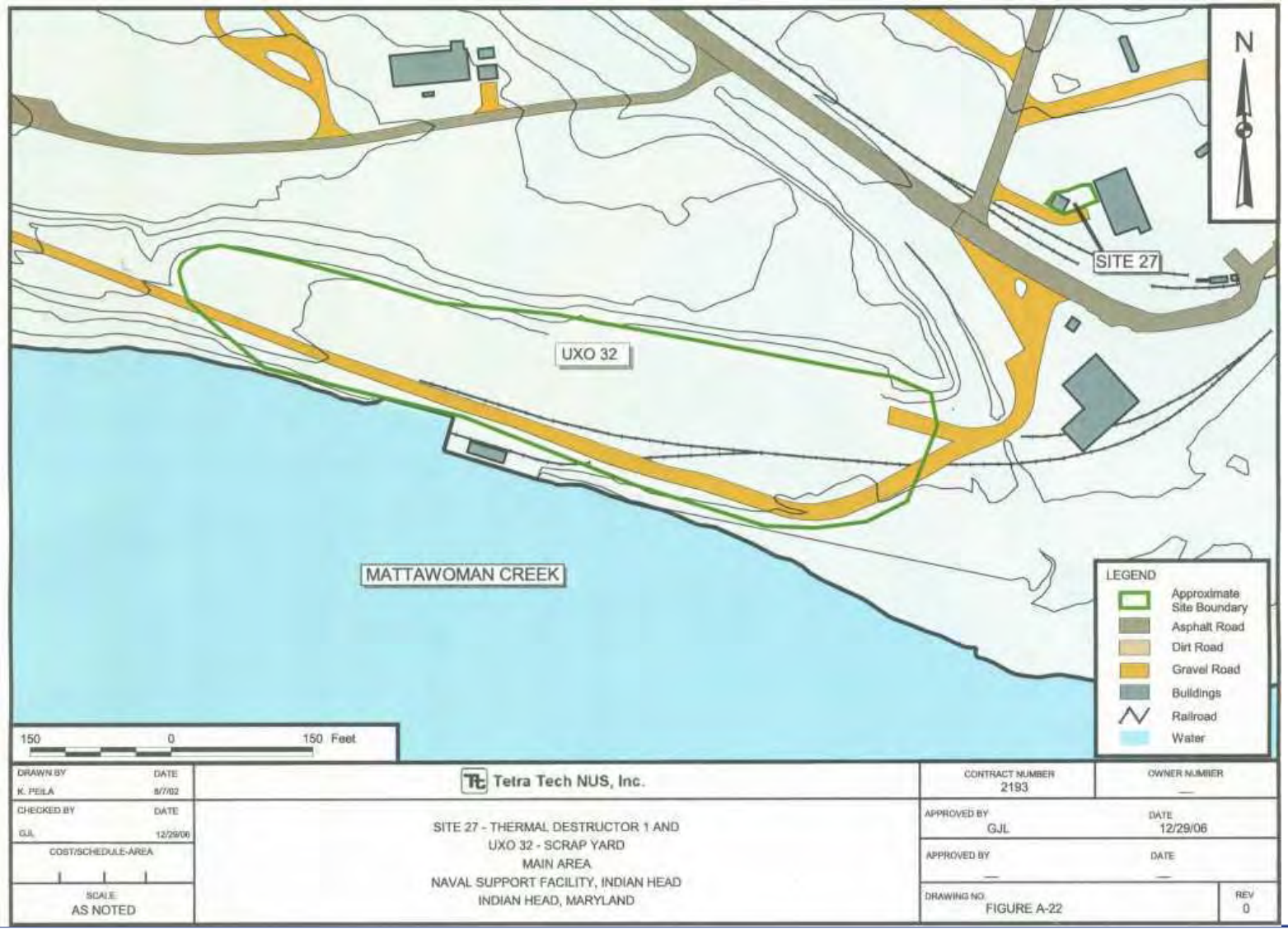
Implementation & Performance: Remedy has been implemented as described in the ROD, and is functioning as intended.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: Site risks posed by contamination have been addressed by removal actions. No additional sampling has been conducted. Groundwater is not impacted. LUCs are verified as protective as long as the site remains in an industrial land-use scenario.

Selected Remedy: Removal of contaminated soils and sediments with elevated metals levels. Wetland restoration and clean fill soil. LUCs

UXO 32 – Scrap Yard



UXO 32 – Scrap Yard

2017 5YR Draft Update

Implementation & Performance: Remedy has been implemented as described in the ROD, and is functioning as intended.

Protectiveness: Remedy is protective of human health and the environment. Exposure pathways that could result in unacceptable risk are being controlled.

Data Evaluation: Site risks posed by contamination and ordnance have been addressed by removal actions. No additional sampling has been conducted. Groundwater in the site's vicinity is currently being studied as Site 70. LUCs are verified as protective as long as the site remains in an industrial land-use scenario, and ICs prevent the use of the shallow aquifer as drinking water.

Selected Remedy: Debris, soil, and munitions removal via IRAs (2002, 2006 & 2007). LUCs.

Contacts and Questions

Points of Contact:

- **NAVFAC Washington RPM:** Alex Scott
- **Indian Head PM:** Andrew Louder

Questions ?