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FINAL NO FURTHER ACTION DECISION DOCUMENT FOR SITE 8 NSWC INDIAN HEAD MD
12/01/2013
CH2M HILL

Final

**No Further Action Decision Document
for Site 8**

**Naval Support Facility Indian Head
Indian Head, Maryland**

Contract Task Order 18

December 2013

Prepared for

**Department of Navy
Naval Facilities Engineering Command
Washington**

Under the

**NAVFAC CLEAN 1000
Contract N62470-08-D-1000**

Prepared by



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CONCURRENCE FOR NO FURTHER ACTION

SIGNATURE PAGE

Site 8

Naval Support Facility Indian Head

In 2012, the Department of the Navy (Navy), in partnership with the U.S. Environmental Protection Agency (EPA) Region III and Maryland Department of the Environment, completed a non-time critical removal action at Site 8 at the Naval Support Facility Indian Head in Indian Head, MD. Because the removal action reduced the levels of lead and mercury in soil and sediment to acceptable risk levels for human and ecological receptors, no further action (NFA) is recommended for the soil and sediment in the stream, and sediment in the pond at Site 8. The removal action has achieved the remedial action objectives identified in the Engineering Evaluation/Cost Analysis (EE/CA).

In 1984, a removal action was completed for mercury-contaminated soil due to leakage from a drain pipe leading from Building 766. In 1994, another removal action was completed for mercury-contaminated soil and sediment in the upper 300-foot section of the stream. In 2006, an investigation was conducted to characterize lead and mercury concentrations in the sediment in the lower and middle sections of the stream, and sediment and fish tissue in the pond. The results indicated that lead concentrations in the stream sediment had decreased over time, whereas mercury concentrations had increased over time. An ecological risk screening suggested that lead and mercury in sediment of the lower stream and the northwest portion of the pond might pose an unacceptable risk to ecological receptors. Two rounds of sampling were conducted in 2008 and 2009 to delineate the lateral and vertical extents of chemicals of potential concern in soil and sediment. Based on the results, the excavation footprint was defined and it was determined by the Indian Head Installation Restoration Team (IHIRT) that post-excavation confirmation sampling was not required.

An EE/CA was completed in 2011, which provided a comparison and evaluation of alternatives for the site, and documented the reason for selecting excavation of lead- and mercury-contaminated soil and sediment in the lower section of the stream, and sediment in the upper portion of the pond that contained contaminant concentrations greater than 10 milligrams per kilogram. The IHIRT selected a cleanup goal of 10 milligrams per kilogram because it would be adequately protective of human health and the environment. Based on the recommendation in the EE/CA, a non-time critical removal action was completed in October 2012; approximately 5,202 tons of soil and sediment were removed.

In accordance with Section 9.3 subsection D(3) of the Federal Facilities Agreement, it is the consensus of the Navy and EPA, with concurrence from the Maryland Department of the Environment and other members of the IHIRT, that Site 8 requires NFA under the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act. If contamination posing an unacceptable risk to human health or the environment is discovered after execution of this agreement, the IHIRT agrees to reevaluate this site as deemed necessary.

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Acronyms and Abbreviations

ARAR	applicable or relevant and appropriate requirements
BTAG	Biological Technical Assistance Group
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
IAS	Initial Assessment Study
IHIRT	Indian Head Installation Restoration Team
mg/kg	milligram(s) per kilogram
Navy	Department of the Navy
NFA	no further action
NSF-IH	Naval Support Facility Indian Head
NTCRA	non-time-critical removal action
RAO	remedial action objective

SECTION 1

Introduction

The objective of this report is to document the basis for the no further action (NFA) decision for Site 8 at Naval Support Facility Indian Head (NSF-IH) in Indian Head, Maryland. This decision document was prepared by CH2M HILL under the Department of Navy (Navy), Naval Facilities Engineering Command Comprehensive Long-Term Environmental Action Navy 1000 Contract N62470-08-D-1000, Contract Task Order 18. This report provides the written documentation of the NFA status of Site 8 for inclusion in the Administrative Record.

This document provides the background information, nature and extent of contamination, summary of the non-time-critical removal action (NTCRA), and decision summary for NFA at Site 8. The NTCRA was selected based on the findings and conclusions of the following:

- *Initial Assessment Study* (Fred C. Hart Associates, Inc., 1983)
- *NACIP Confirmation Study, Naval Ordnance Station, Indian Head, Maryland* (CH2M HILL, 1985)
- *Draft Final Technical Memoranda, Site 8—Nitroglycerin Plant Office, Indian Head Naval Ordnance Station, Indian Head, Maryland* (ABB Environmental Services, Inc. 1991)
- *Site Characterization Report for Site 8—Nitroglycerin Plant Office, Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland* (Halliburton NUS Corporation, 1993)
- *Post Removal Action Report for Site 8—Nitroglycerin Plant Office at Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland* (Halliburton NUS Corporation, 1995)
- *Desktop Evaluation for Site 8—Mercury Contamination at Building 766, and Site 56—Lead Contamination at Industrial Wastewater Outfall 87, Naval District Washington Indian Head* (CH2M HILL, 2006a)
- *Additional Investigation Results for Sites 8 and 56 at Naval Support Facility, Indian Head* (CH2M HILL, 2006b)
- *Technical Memo Pre-Excavation Investigation Results for Site 8 Naval Support Facility Indian Head, Indian Head, Maryland* (CH2M HILL, 2010)
- *Engineering Evaluation/Cost Analysis for Site 8, Naval Support Facility Indian Head, Indian Head, Maryland* (CH2M HILL, 2011)

Background

This section presents the background information for Site 8 relating to site description and history, and previous investigations and key findings.

2.1 Site Description and History

Site 8 consists of a stream and northwest portion of a pond located in the central portion of the Main Installation of NSF-IH (Figure 2-1). The site covers approximately 2.6 acres. The stream is approximately 1,300 feet in length along its main channel and extends from a culvert located near Building 766 and flows into a marshy area and South Pond. Outflow from the pond discharges to the south through a weir near Noble Road and ultimately into Mattawoman Creek, which is approximately 1,500 feet to the southeast (Figure 2-2). South Pond is located north of Noble Road and west of the Atkins Road Extension.

Building 766, which was constructed in 1953, was the former location of the Nitroglycerin Plant Office and Laboratory, Biazzi Plant. Nitrometers, which contained mercury, were used in testing in the laboratory of Building 766. Historically, spills of mercury occurred between 1958 and 1981, when spent mercury was rinsed and transferred in the laboratory sinks of Building 766. Estimates of the quantity of contamination released are between 23 and 500 pounds of elemental mercury. Before 1981, the sink and floor drains were connected to a 3-inch drain line that entered a manhole located approximately 30 feet east of Building 766. In 1981, the sink drains were rerouted, floor drains were sealed shut, and mercury traps were placed on the drains.

The original drain line and manhole were replaced following the removal action in 1984. The current manhole or drainage outfall consists of a 36-inch-diameter concrete pipe that terminates with gabion walls at the top of the upper section of the stream. This 36-inch drainage pipe serves as a discharge point for surface water runoff and drainage from areas northwest of Site 8. The upper section of the stream conveys drainage from the manhole along a stretch of intermittent stream extending roughly 300 feet. This section of the stream represents the approximate extent of a second removal action conducted in 1994.

2.2 Previous Investigations and Key Findings

This section presents a summary of the previous investigations and their key findings and a chronology of the removal actions conducted at Site 8.

2.2.1 Initial Assessment Study and First Removal Action

An Initial Assessment Study (IAS) (Fred C. Hart Associates, Inc., 1983) was conducted at Site 8 to identify and assess sites posing a threat to human health or to the environment owing to contamination from past hazardous materials operations at NSF-IH. The IAS concluded that the site warranted further investigation and recommended a Confirmation Study.

A removal action was conducted in 1984 after an excavation contractor (working on a project unrelated to Site 8) inadvertently broke the 3-inch drain pipe leading from Building 766 to the manhole, and mercury was observed leaking into the soil. The drain pipe, manhole, and approximately 200 drums (55-gallon) of mercury-contaminated soil were excavated and removed from the site. Post-removal sampling results indicated that mercury concentrations in remaining soil were consistent with background concentrations. The drain pipe and manhole were replaced, and the area was backfilled with clean soil (Brown & Root Environmental, 1996).

2.2.2 NACIP Confirmation Study

The NACIP Confirmation Study (CH2M HILL, 1985) was conducted to further evaluate Site 8 based on the recommendation in the IAS. The study concluded that sediments and surface water at Site 8 were “extensively contaminated with mercury” and contamination may be sufficient at some locations to pose potential threats both to human health and to the environment. The study recommended the restriction of access to

contaminated areas, the removal of sediments in highly contaminated areas, continued monitoring to detect any offsite migration of contaminants, and, if necessary, further corrective measures.

2.2.3 Site Characterization Studies and Second Removal Action

A Supplemental Site Characterization Study (ABB Environmental Services, Inc., 1991) was performed to provide data to support a Feasibility Study for Site 8. The fieldwork included the collection of surface water, sediment, and surface soil samples to gauge mercury contamination at the site. The study concluded that mercury transport was related to sediment transport rather than migration in solution in surface water.

A Site Characterization Study (Halliburton NUS Corporation, 1993) was conducted to further define the extent of mercury contamination at Site 8. The results indicated that distribution of mercury at Site 8 was primarily located in the Building 766 area and the upper section of the stream, specifically in the 300-foot section downgradient from the location of the manhole.

The Post Removal Action Report (Halliburton NUS Corporation, 1995) summarized the removal action conducted in 1994, in which approximately 440 cubic yards of sediment/soil with mercury concentrations above 10 milligrams per kilogram (mg/kg) were removed from the 300-foot reach of the stream downgradient of the manhole. Following completion of the removal action, the stream bed was backfilled with 18 to 30 inches of clean soil and graded, the upgradient 120 feet of the stream channel was lined with geotextile fabric and riprap, and the remaining area was revegetated.

2.2.4 Desktop Evaluation and Additional Investigation

A desktop evaluation was completed by CH2M HILL in 2006 for Site 8; it summarized key findings from a review of available documents and concluded that the sources of contamination at the site had been remediated, and no adverse human health or ecological impacts had been observed through numerous investigations. CH2M HILL recommended the collection of new data in order to make a recommendation for the site because the available data were more than 10 years old. (CH2M HILL, 2006a)

An additional investigation was conducted by CH2M HILL in 2006 to characterize lead and mercury concentrations in (1) the stream and the pond sediment to determine if concentrations had changed and (2) fish tissue from the pond to assess bioaccumulation of lead and mercury in fish (CH2M HILL, 2006b). The results indicated that lead concentrations in the stream sediment had decreased over time, whereas mercury concentrations had increased over time. The concentrations of mercury in the pond sediment were comparable to previous concentrations; however, lead concentrations had increased with time. The results showed a decreasing trend of lead and mercury in fish tissue. The ecological risk screening results suggested that lead and mercury in sediment of the lower stream and the northwest portion of the pond might pose an unacceptable risk to other ecological receptors, such as the benthic invertebrate community.

2.2.5 Pre-excavation Study

A pre-excavation investigation was conducted by CH2M HILL in 2010. The primary objective of the investigation was to delineate the horizontal and vertical extents of lead and mercury in sediment in the lower section of the stream and in the northwest portion of the pond, to establish the excavation footprint for a removal action, and to characterize the sediments to eliminate the need for post-excavation confirmatory sampling. Data and cost-benefit analysis results from the investigation were used to select an appropriate cleanup goal and excavation footprint/depth at Site 8 (CH2M HILL, 2010). The Indian Head Installation Restoration Team (IHIRT) concluded that a cleanup goal of 10 mg/kg would be adequately protective of human health and the environment.

2.2.6 Engineering Evaluation/Cost Analysis

An Engineering Evaluation/Cost Analysis (EE/CA) was completed by CH2M HILL in 2011 using the results of the pre-excavation investigation. The recommended remedial alternative in the EE/CA was excavation of contaminated soil and sediment containing mercury concentrations greater than 10 mg/kg. The IHIRT concluded that 10 mg/kg was an acceptable action level. Soil and sediment excavation, offsite disposal, and clean backfill are proposed for the lead- and mercury-contaminated soil and sediment in the stream, and sediment in the

northwest portion of the pond. This action will reduce concentrations of lead and mercury in soil and sediment to acceptable levels of human health and ecological risks.

2.2.7 Action Memorandum

An action memorandum was finalized in May 2012 to document approval of the NTCRA proposed to be undertaken at Site 8. The action provides the Navy with a permanent solution that is potentially unhindered by future land use restrictions at the site. It will reduce lead and mercury concentrations to levels that will eliminate unacceptable human health and ecological risks and eliminate the potential future concern or pathway for contaminant transport to human and ecological receptors in surrounding and/or downgradient areas.

2.2.8 Non-time-critical Removal Action

See Section 4 for details.



- Legend**
- IR Site Boundary
 - Installation Boundary

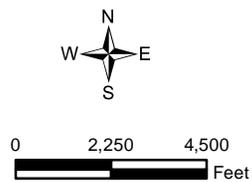
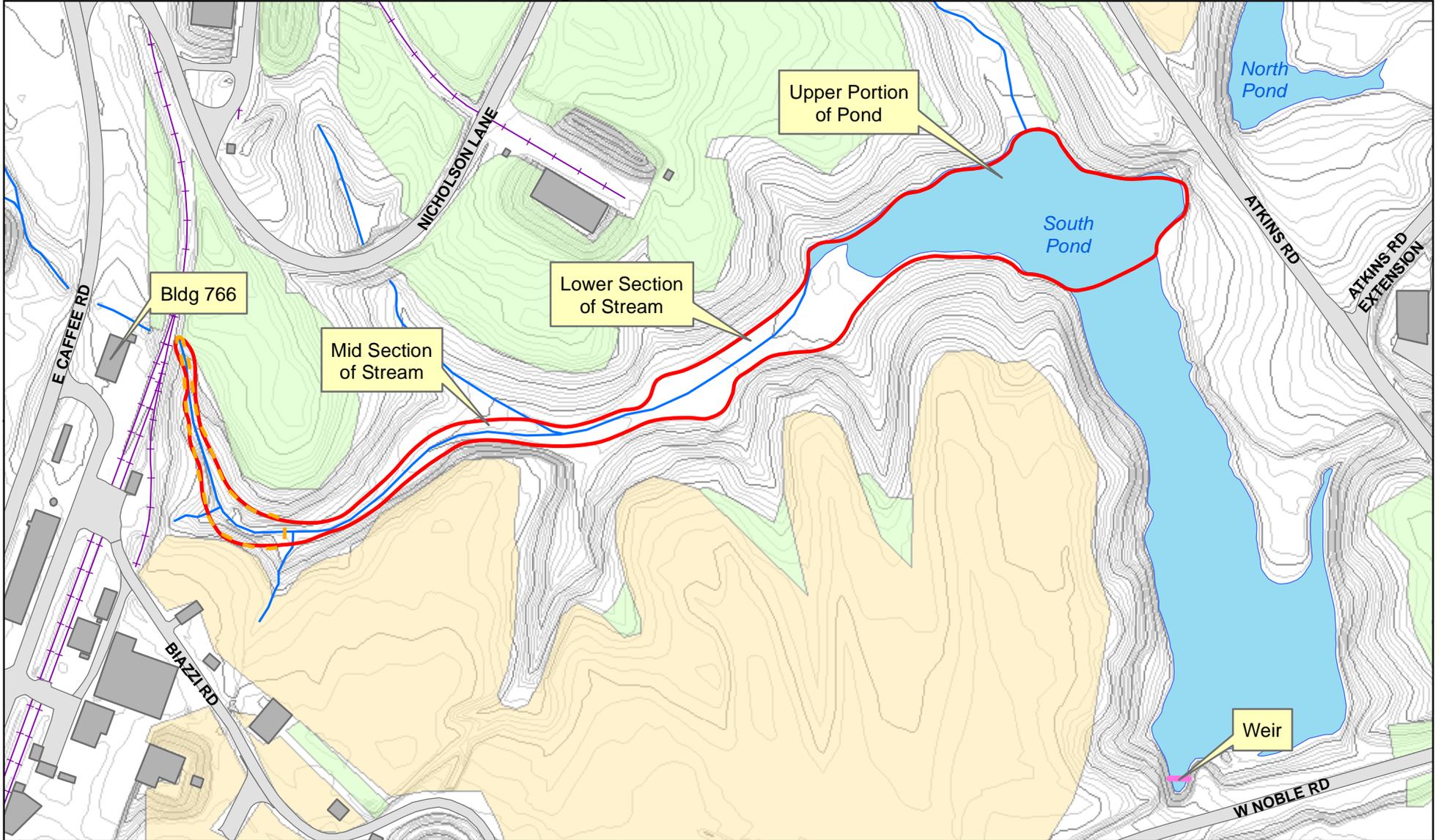


Figure 2-1
Facility Map
Decision Document for Site 8
NSF-IH, Indian Head, Maryland



Legend

- Approximate Extent 1994 Removal Action at Site 8
- Weir
- Approximate Site Boundary
- Building
- Road Area
- + Railroad
- Cultural Sensitive Areas
- Cultural Probable Sensitive Areas
- Streams
- Contours (1ft)
- Contours (5ft)

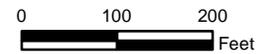


Figure 2-2
Site Layout
Decision Document for Site 8
NSF-IH, Indian Head, Maryland

Nature and Extent of Contamination

3.1 Contaminants of Concern and Impacted Media

The nature and extent of soil and sediment contamination at Site 8 is based on the data collected in the pre-excavation investigation. The soil and sediment data combined across the site indicated that for the 0- to 0.5-foot depth interval, lead concentrations ranged from 2.5 mg/kg to 2,070 mg/kg (Figure 3-1), and mercury concentrations ranged from 0.05 mg/kg to 130 mg/kg (Figure 3-2). For the 1.5- to 2.0-foot depth interval, lead concentrations ranged from 4.7 mg/kg to 1,040 mg/kg (Figure 3-3), and mercury concentrations ranged from 0.03 mg/kg to 179 mg/kg (Figure 3-4). For the 2.0- to 2.5-foot depth interval, lead concentrations ranged from 3.2 mg/kg to 473 mg/kg (Figure 3-5) and mercury concentrations from 0.03 mg/kg to 115 mg/kg (Figure 3-6).

Mercury concentrations in the sediment exceeded the human health screening level for mercury; the screening criterion is 78 mg/kg, which is 10 times the residential soil regional screening level for methyl mercury. Mercury concentrations did not exceed the screening level for an industrial worker, which is 1,000 mg/kg (10 times the industrial soil regional screening level for methyl mercury).

Whole sediment toxicity tests of Site 8 sediment showed that the survival of organisms exposed to the sediment ranged from 28.8 to 97.5 percent, indicating that the benthic invertebrate community was at risk in some areas of the site where concentrations were high enough to adversely affect the growth and survival of benthic invertebrates.

Aquatic invertebrate composite tissue samples were collected from the site to determine whether lead or mercury in the sediment was accumulating in the aquatic food chain to the extent that they would pose an unacceptable risk to upper-trophic-level wildlife. The results showed that lead was not accumulating in aquatic invertebrates to an extent that posed an unacceptable risk to birds and mammals foraging in the area. However, the results for mercury indicated that mercury was bioaccumulating in the aquatic food chain to an extent to likely pose an unacceptable risk to shorebirds that forage at the site.

Long-term biomonitoring of fish tissue concentrations in the pond indicated that neither lead nor mercury was accumulating in fish at levels that would pose significant risks to fish or fish-eating wildlife. Therefore, the unacceptable ecological risks posed by lead and mercury in the sediment were limited to risk to the benthic invertebrate community and to birds that feed on aquatic invertebrates.

3.2 Remedial Action Objectives

The remedial action objective (RAO) for Site 8 was to remove and dispose of lead- and mercury-contaminated soil and sediment in the lower section of the stream and lead and mercury-contaminated sediment in the upper portion of the pond, so that soil and sediment left in place would not represent an unacceptable risk to the environment, and to prevent a continuing source of lead and mercury contamination to the aquatic ecosystem within Site 8.

3.3 Cleanup Criteria

The delineation of the soil and sediment removal areas at Site 8 was based on the ecological risk evaluation and subsequent discussion by the IHIRT. The IHIRT performed a comprehensive evaluation of the sampling data to ensure the site had been sufficiently characterized and removal areas fully delineated. The risk evaluation suggested that a preliminary remediation goal for mercury of approximately 20 mg/kg would be protective of ecological receptors. The Biological Technical Assistance Group (BTAG), however, expressed concerns regarding the uncertainty surrounding the proportion of methylmercury in the sediments and the potential risk posed by methylmercury under future conditions. BTAG recommended an evaluation of post-removal mercury concentrations using a preliminary remediation goal of 10 mg/kg with clean backfill for both the stream and

pond. Cleanup to 10 mg/kg of mercury would also result in acceptable mercury concentrations and acceptable human health risk levels for potential receptors – recreators/trespassers, industrial workers.

On November 11, 2010, the Navy approved BTAG's proposed cleanup goal and remedial action for Site 8, which was discussed by the IHIRT and the BTAG on October 19, 2010. As a result, the selected remedy was a removal action of soil and sediment in the stream, and sediment in the pond in areas with mercury concentrations exceeding 10 mg/kg, followed by backfilling with common fill and 6 inches of topsoil to meet pre-existing conditions. With this action, the BTAG and the IHIRT agreed that the Navy would not perform long-term monitoring of soil, sediment, and biota mercury levels because this action would provide adequate protection of the environment.

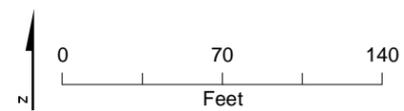
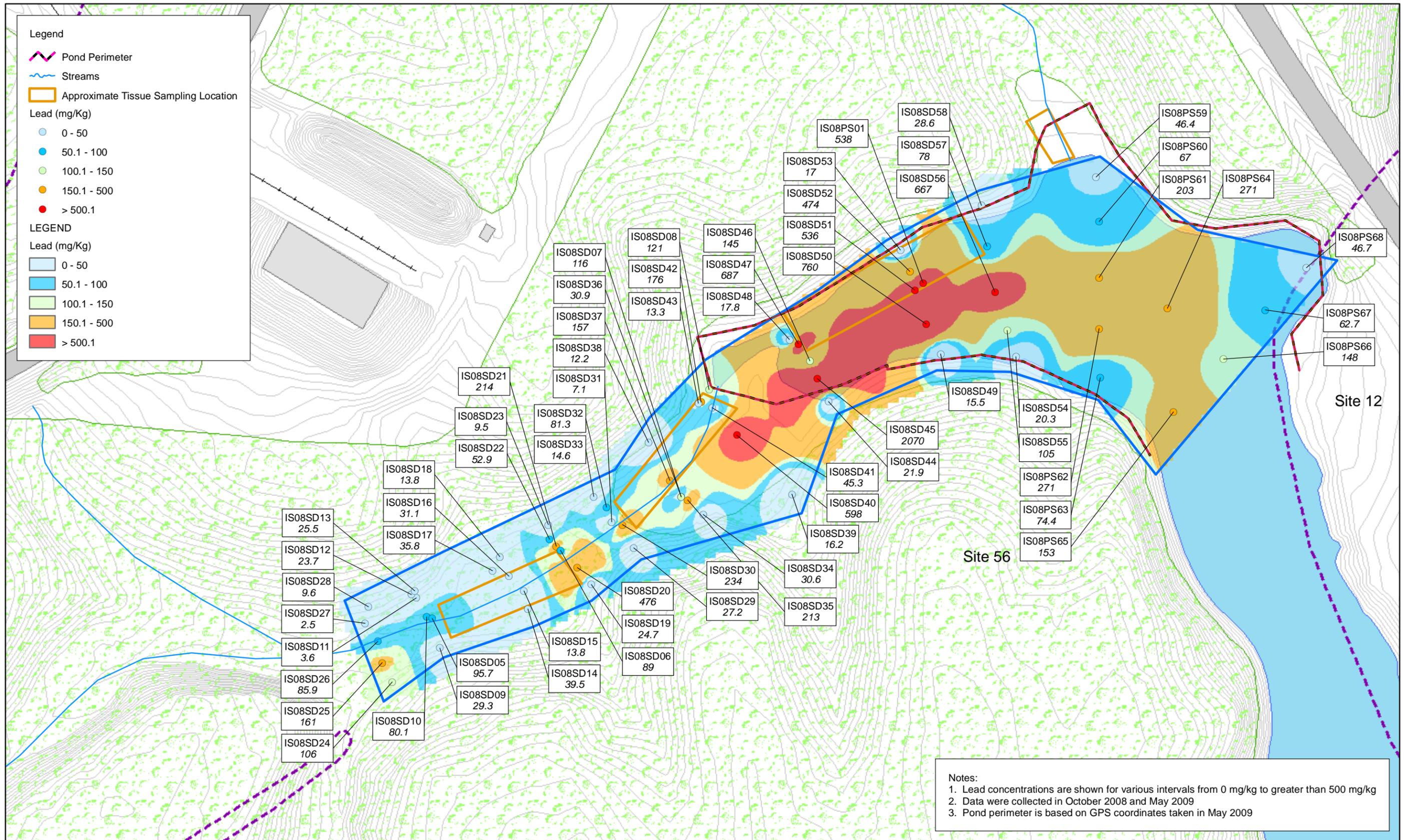


Figure 3-1
Lead Detections in the 0 to 0.5-foot Depth Interval
Decision Document for Site 8
NSF-IH Indian Head, Maryland

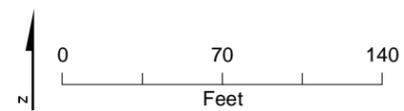


Figure 3-2
Mercury Detections in the 0 to 0.5-foot Depth Interval
Decision Document for Site 8
NSF-IH Indian Head, Maryland

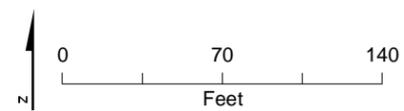
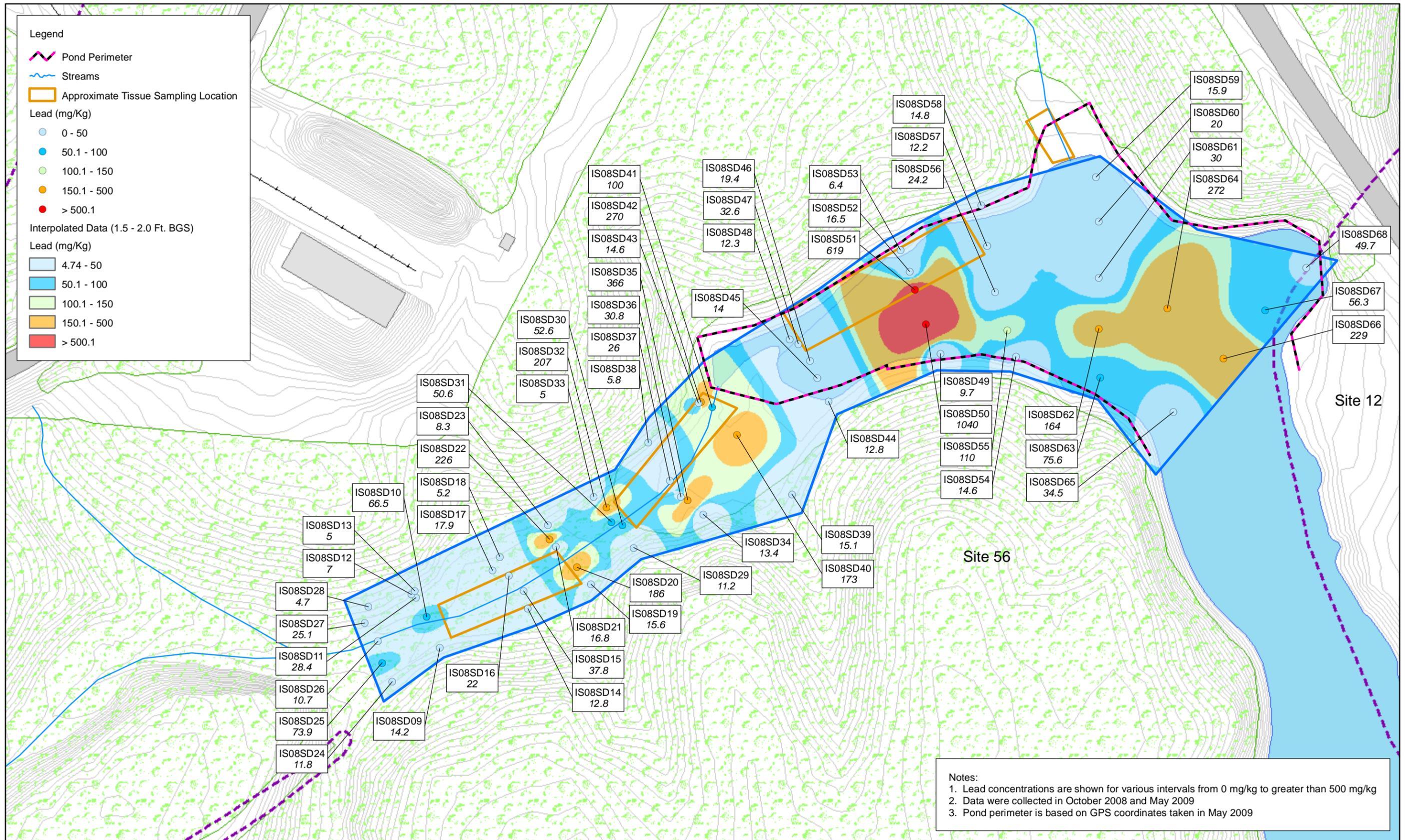
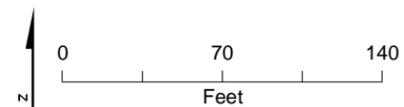


Figure 3-3
Lead Detections in the 1.5 to 2.0-foot Depth Interval
Decision Document for Site 8
NSF-IH Indian Head, Maryland



Figure 3-4
Mercury Detections in the 1.5 to 2.0-foot Depth Interval
Decision Document for Site 8
NSF-IH Indian Head, Maryland



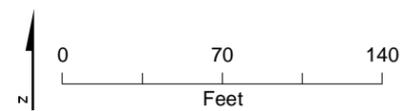
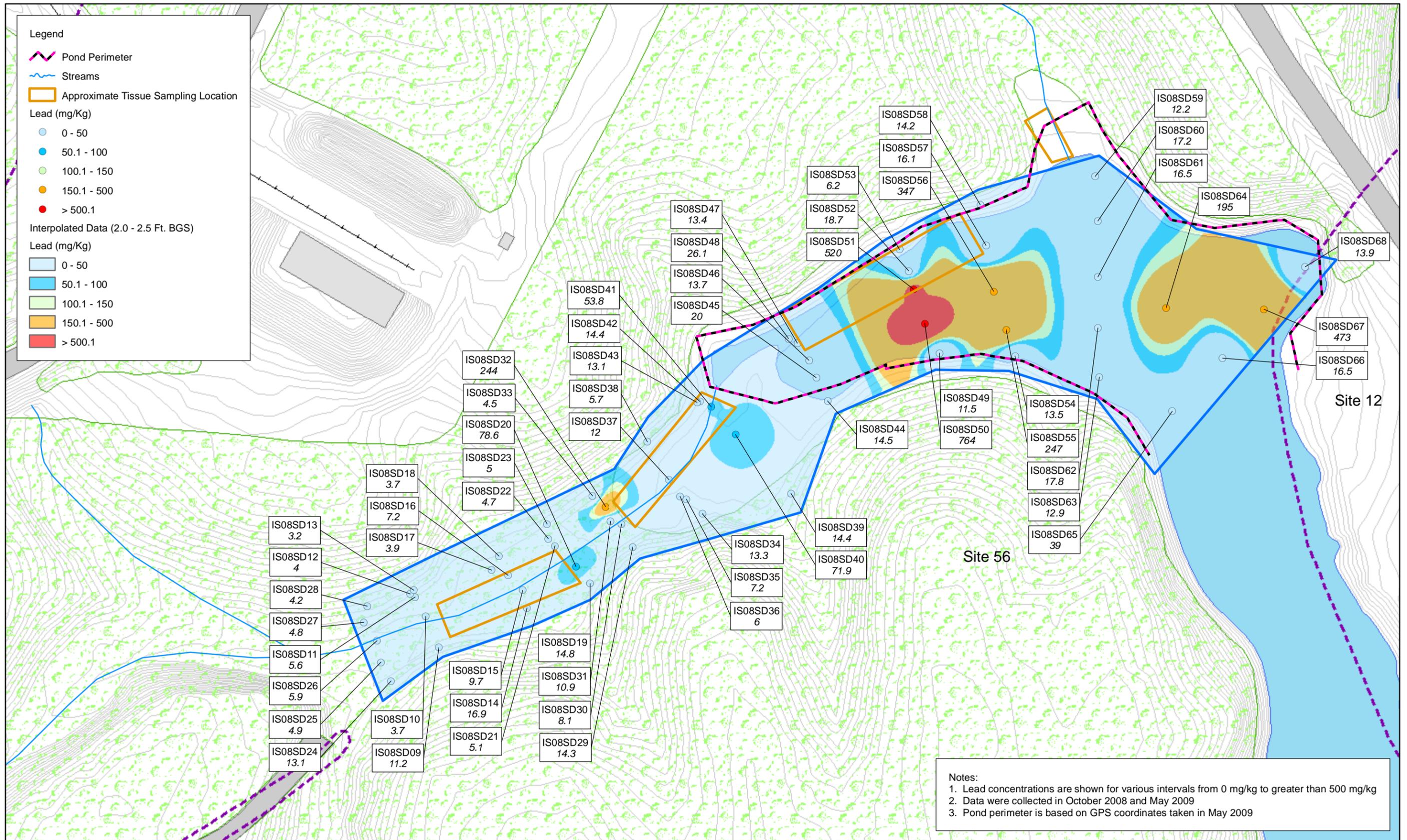


Figure 3-5
Lead Detections in the 2.0 to 2.5-foot Depth Interval
Decision Document for Site 8
NSF-IH Indian Head, Maryland

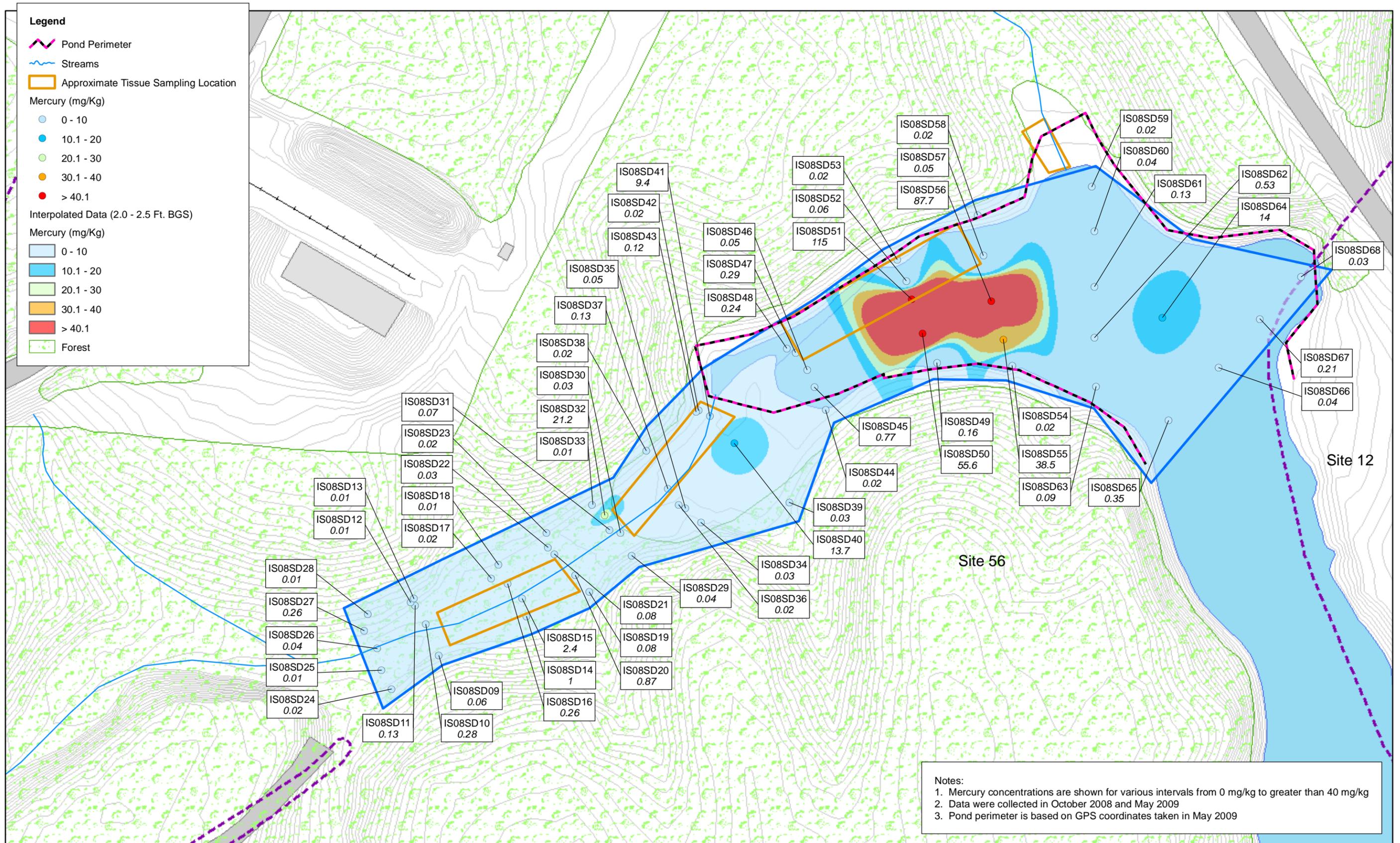


Figure 3-6
 Mercury Detections in the 2.0 to 2.5-foot Depth Interval
 Decision Document for Site 8
 NSF-IH Indian Head, Maryland

Non-time-critical Removal Action

4.1 Effectiveness, Implementability, and Cost

4.1.1 Effectiveness

The overall effectiveness of the remedy is high. The level of effectiveness was assessed based on the number of “effectiveness criteria” that would be satisfied by the alternative. The “effectiveness criteria,” from the federal guidance document (EPA, 1993) are as follows:

1. Protection of public health
2. Protection of workers during implementation
3. Protection of environment
4. Compliance with applicable or relevant and appropriate requirements (ARARs)
5. Level of treatment and containment expected
6. Residual effect concerns

Each criterion is addressed below with respect to the NTCRA.

Protection of Public Health: The NTCRA was considered to protect human and ecological receptors. As discussed in Section 3, lead and mercury posed unacceptable human health and ecological risks at Site 8.

Protection of Workers during Implementation: Workers were protected during implementation of this alternative using personal protection equipment and construction controls, as necessary, and in accordance with the project-specific health and safety plan. The environment was protected through the removal of the potential source of contamination from the site.

Protection of the Environment: Excavation and disposal of the contaminated soil and sediment at Site 8 achieved the RAO, which is protective of human and ecological receptors.

Compliance with ARARs: The remedy complies with the location-specific, action-specific, and chemical-specific ARARs that apply to the implementation of the alternative. The removal action did not endanger groundwater or surface water, and complied with regulations regarding environmentally sensitive locations, excavations, air emissions, storage, transportation, and other ARARs.

Level of Treatment and Containment Expected and Residual Effect Concerns: Soil and sediment excavation with offsite disposal removed and contained the contaminated soil and sediment in a facility specifically designed to manage these media. The potential risks to human and environmental receptors were significantly reduced because the potential for exposures has been prevented. The potential for future contamination of the clean fill to a level greater than the action levels in the area of excavation has been eliminated.

4.1.2 Implementability

The level of implementability was assessed based on the number of “implementability criteria” satisfied by the alternative. The “implementability criteria,” from the federal guidance document (EPA, 1993), are as follows:

1. Construction and operational considerations
2. Demonstrated performance/useful life
3. Adaptable to environment conditions
4. Contributes to remedial performance
5. Can be completed in an acceptable timeframe
6. Availability of equipment, personnel and services, outside laboratory testing capacity, and offsite treatment and disposal capacity

7. Permits required
8. Easements or rights-of-way required
9. Impact on adjoining property
10. Ability to impose institutional controls

Evaluation of implementability essentially comes down to the evaluation of technical and administrative feasibility. The technical feasibility consists of criteria 1 through 6. For Site 8, implementation of an excavation project was straightforward and easily achieved based on criteria 1 through 6. Administrative feasibility involves criteria 7 through 10. These criteria are irrelevant to Site 8 because no permits were required, no rights-of-way were required, and no adjoining property was present. Institutional controls (criterion 10) were not necessary because the removal action reduced risks to acceptable levels.

4.1.3 Cost

The total cost for the Site 8 removal action was \$1,409,140.

4.2 Description of Removal

A summary of the removal action activities is provided in the construction completion report (Shaw, 2013). The following tasks were performed from July through October, 2012:

- Pre-mobilization
 - Obtained base work permits
 - Conducted utility clearance and mark out
 - Prepared an environmental conditions report to document site conditions
- Mobilization and site preparation
 - Set up general support area, including construction of the temporary soil staging cell
 - Marked out removal areas
 - Installed erosion and sediment controls, including construction entrances, earth dike/swale combinations, silt fence, and temporary access culverts
 - Conducted vegetation clearing as necessary to provide adequate access for personnel and equipment
 - Dewatered the South Pond by temporarily removing the steel plate weir from the 60-inch corrugated metal pipe near West Noble Road
 - Installed a temporary access road through the South Pond to the excavation areas
 - Installed an Aqua Dam diversion dike and a Type B earth dike to prevent water from entering the excavation areas during removal activities
- Contaminated soil and sediment removal
 - Excavation at Site 8 was divided into seven areas, as shown on Figure 4-1. Excavation was performed to a depth of 2.5 feet below ground surface within all areas except the area of the pond identified as Subarea A, where excavation was limited to 1.5 feet below ground surface.
 - Excavated soil and sediment were relocated to the temporary excavation material stockpiling area and stabilized with dehydrated lime. The excavated material stockpile was composed of geosynthetic clay liner, nonwoven geotextile, and straw bales.
 - A portable sediment tank was used as needed for dewatering during excavation activities, which met the *Maryland Standards and Specifications for Soil Erosion and Sediment Control*.

- Post-excavation confirmation sampling was not conducted at Site 8. The pre-excavation investigation delineated the horizontal and vertical extents of lead and mercury in sediment in the lower section of the stream and the pond. The IHIRT reached a consensus on the lateral and vertical extents of excavation for the site and concluded that post-excavation confirmation sampling was not required (CH2M HILL, 2010).
- Waste disposal
 - Excavated soil and sediment were characterized for full toxicity characteristic leaching procedure parameters (volatiles, semi-volatiles, metals, herbicides, and pesticides); polychlorinated biphenyls; total petroleum hydrocarbons diesel range organics and gasoline range organics; and reactivity, corrosivity, and ignitability. The sample results indicated that the concentrations in the soil and sediment were below hazardous regulatory limits and landfill disposal facility acceptance limits.
 - A total of 5,202 tons of non-hazardous soil and sediment were removed from Site 8 and disposed of it at Westport Reclamation located in Lothian, Maryland.
- Site restoration
 - The temporary access road and earth dike were removed as excavation progressed to the east and the common fill material was used as backfill for the excavated areas to a level of 6 inches below the finished grade and then covered with 6 inches of topsoil to meet pre-existing grades.
 - The crane mats, excavated material stockpile area, stabilized construction entrances, Aqua Dam diversion dike, earth dike, and temporary access culverts were removed.
 - The wetlands were restored following completion of excavation and backfilling activities. Woody debris along the edges and in the pathway of the temporary access road that was removed during excavation was placed back in the wetland. All stabilization seeding in the wetland and wetland buffer consisted of the following: 40 percent barley (*Hordeum sp.*), 30 percent perennial rye, 20 percent annual rye, and 10 percent oats (*Uniola sp.*).
 - Various wetland plant species were planted in the wetland area including: rice cutgrass (*Leersia oryzoides*), arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), lizard's tail (*Saururus cernuus*).
 - The steel plate weir in the 60-inch corrugated metal pipe near West Noble Road was reinstalled to the height specified by base personnel.
 - All disturbed areas except for the wetlands were seeded, fertilized, limed, and had straw applied to reestablish vegetation.
 - Shaw planted two white oak (*Quercus alba*) trees on the northeastern slope to mitigate the loss of one white oak tree that was damaged and removed during the removal action.

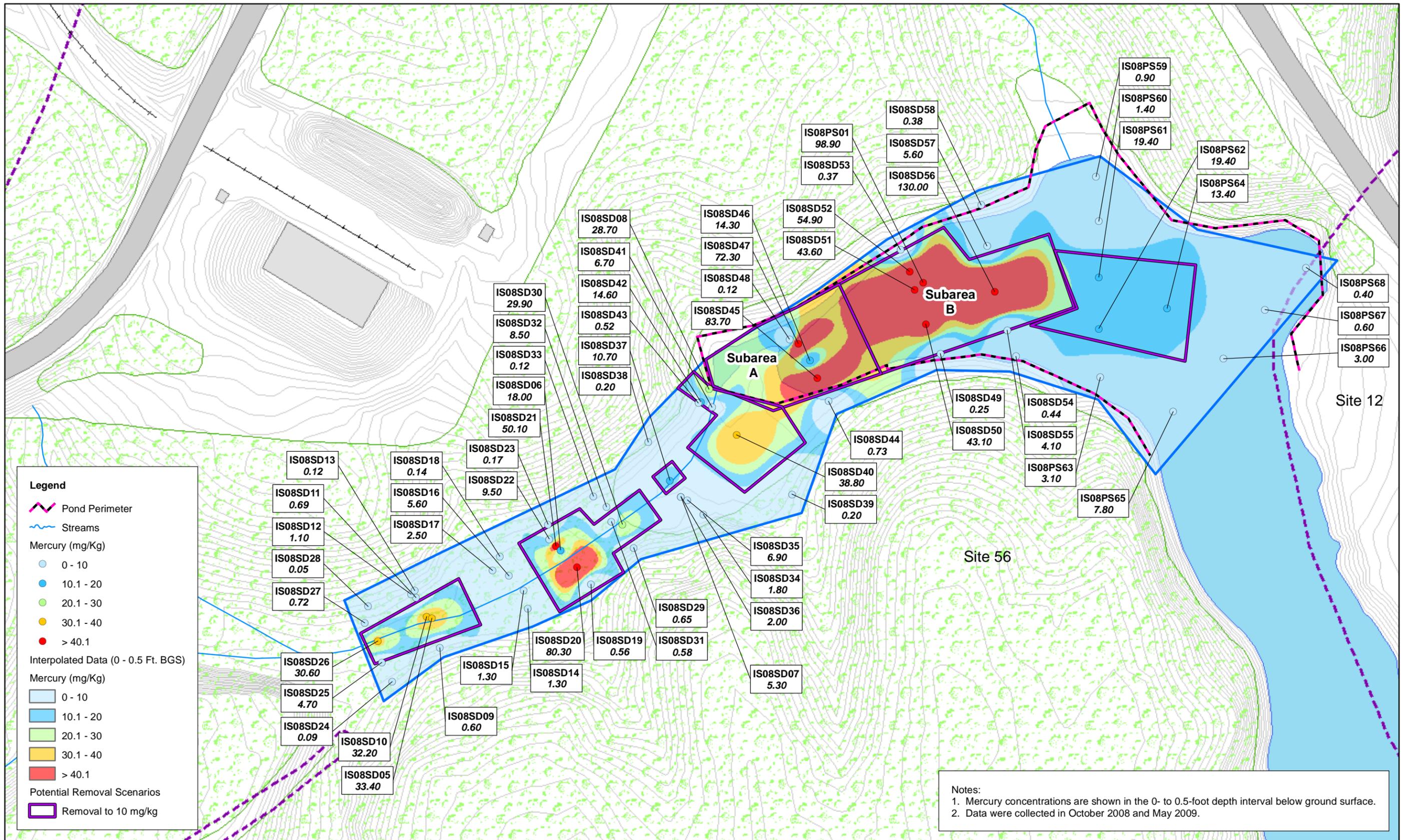


Figure 4-1
Excavation Footprint for 10 mg/kg Cleanup Goal
Decision Document for Site 8
NSF-IH Indian Head, Maryland

Decision Summary

5.1 Rationale for NFA

The IHIRT reached a consensus that NFA is recommended at Site 8. The removal action reduced concentrations of lead and mercury in soil and sediment in the stream, and sediment in the pond to acceptable levels of human health and ecological risks. The removal action has achieved the RAOs identified in the EE/CA.

SECTION 6

References

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