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TECHNICAL MEMORANDUM REGARDING RESULTS OF OCEANA SALVAGE YARD
BURIAL UNIT AND DEBRIS PILE SAMPLING NAS OCEANA VA

06/29/2011
CH2M HILL

Results of Oceana Salvage Yard Burial Unit and Debris Pile Sampling, Naval Air Station Oceana, Virginia Beach, Virginia

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COPIES: NAVFAC Mid-Atlantic
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Background

The Oceana Salvage Yard is located east of Naval Air Station (NAS) Oceana and is privately owned (**Figure 1**). Access to the Salvage Yard is provided by a gravel road that was constructed on crushed car batteries sometime between 1955 and 1963. The Access Road provides the only vehicular access from Oceana Boulevard through Navy property to the Oceana Salvage Yard Property. During operation of the Salvage Yard, which began in the 1960s, waste was improperly disposed on the Navy property to the north and south of the Access Road in numerous debris piles. Additionally, battery waste was buried in a portion of the Navy property just west of the Salvage Yard referred to as the "Burial Unit."

From 1993 through 1995, the Salvage Yard property owners purportedly engaged in a cleanup of the Burial Unit. A number of environmental investigations were completed at the Salvage Yard and on Navy property beginning in 1997. The results of these investigations indicated elevated concentrations of lead in soils on the Navy and Oceana Salvage Yard properties, visible and buried debris on the Navy property, and the presence of battery fragments beneath the roadway and in areas adjacent to the roadway. Details of these investigations are discussed in the *Final Technical Memorandum Work Plan: Oceana Salvage Yard Burial Unit and Debris Pile Sampling Plan, Naval Air Station Oceana, Virginia Beach, Virginia* (CH2M HILL, 2011).

In 2007, the United States Environmental Protection Agency (USEPA) issued a Draft Consent Order for the Oceana Salvage Yard Site, which included the Navy-owned Access Road and Burial Unit (USEPA, 2007). The Final Consent Order for the Oceana Salvage Yard Site did not include the Access Road, Burial Unit, or any other contamination on the Navy portion of the property. Contamination on the Oceana Salvage property was remediated in accordance with the 2007 Consent Order (USEPA, 2008). However, consistent with the decision of the NAS Oceana Tier I Partnering Team (July 2010), it was agreed that the Navy portion of the site could be remediated in accordance with the 2007 Draft Consent Order.

In order to complete the requirements of the Draft Consent Order, it was necessary to delineate lead contaminated soils within the shoulders of the Access Road and the Burial Unit where total lead concentrations were greater than 800 mg/kg. Delineation/

confirmation sampling was performed in two field events. The first sampling event was performed within the Access Road shoulders and was completed in 2010. The details and analytical results are documented in *Oceana Salvage Yard Access Road Confirmation Sampling, Naval Air Station Oceana, Virginia Beach, Virginia* (CH2M HILL, 2010).

This technical memorandum details the second field event of delineation/ confirmation sampling, performed within the Burial Unit in March 2011. As detailed in the Technical Memorandum Work Plan (CH2M HILL, 2011), this investigation was completed to delineate the lead contamination within the boundary of the Burial Unit. While not required by the Draft Consent Order, investigation of the debris piles and property boundary was also completed to aid the Navy in a housekeeping cleanup of the debris piles and to evaluate any contamination along the property line shared with Oceana Salvage Yard.

The objectives of the Burial Unit, debris pile, and property line investigation were to:

- Adequately delineate soil within the Burial Unit where concentrations of total lead are greater than 800 milligrams per kilogram (mg/kg) to a maximum depth of 2 feet below ground surface (bgs). This soil delineation determines areas within the Burial Unit that will require future excavation.
- Verify locations of surficial debris and buried debris mounds that were identified during previous investigations and denote any previously undiscovered debris locations at the site using Global Positioning System (GPS)
- Document approximate dimensions and the type of surficial debris observed at each of the debris piles at the site
- Document grid locations within the Burial Unit using GPS
- Determine whether total lead or polychlorinated biphenyl (PCB) contamination is present in soils beneath debris piles that were identified as a potential contamination source
- Survey and mark the property boundary between Oceana Salvage Yard and the Navy property
- Evaluate total lead concentrations between the property boundary and the fence line if the existing fence line for the Oceana Salvage Yard lies within the Navy property

Environmental Conservation Laboratories, Inc. was subcontracted by CH2M HILL to analyze the soil samples. Michael Surveying and Mapping was subcontracted by CH2M HILL to complete the land surveying. The field investigation was completed in the Spring of 2011. Field methods and results of the investigation are discussed below.

Burial Unit Sampling

Prior to sample collection, the approximately 275-foot by 50-foot Burial Unit Area was partitioned into 22 grids approximately 25-foot by-25 feet (**Figure 2**). Grid nodes were located and marked using GPS equipment. Soil samples from five locations in each grid were collected from 0-feet to 2-feet bgs (or until refusal) using a stainless steel hand auger. The five subsurface soil samples from each grid were composited and homogenized in a

stainless steel bowl prior to placement in laboratory-prepared sample jars for shipment. Samples were analyzed for lead (method SW846 6010B).

Sample results are included on **Table 1** and shown on **Figure 2**. Lead was detected in all samples at concentrations ranging from 100 mg/kg (OSAL-SO41) to 18,900 mg/kg (OSAL-SO53). Concentrations exceeded the level requiring cleanup based on the Draft Consent Order (800 mg/kg) in all grids with the exception of SO37, SO38 and SO41, which are located in the northern portion of the Burial Unit.

Preliminary Debris Pile Investigation

Debris piles to the north and south of the Access Road were evaluated to determine the dimensions, contents, and potential contaminant sources. Debris piles identified are shown on **Figure 3**. Due to the heavy vegetation and tree cover at the site, the GPS unit did not function properly. Therefore, the dimensions and locations were measured with a tape and recorded in the field book. Descriptions of each pile including contents and dimensions are included in **Table 2**. Debris was photographed and logged by debris pile. Photograph identifications are listed in **Table 2** according to debris pile. Photographs are included as **Attachment A**.

Following the logging and photographing of the debris piles, 11 locations beneath debris piles were selected for soil sampling based on visible evidence of battery fragments and/or insulated cables. Soil samples were collected using a stainless steel hand auger and placed in laboratory-prepared sample containers. Samples were packed on ice for shipment to the offsite laboratory for lead analysis (method SW846 6010B) or PCB analysis (method SW846 8260B), as appropriate based on the waste stream present in the debris pile (battery fragments or insulated cable).

Results of debris pile sampling are included in **Table 3** and shown on **Figure 2**. Lead concentrations ranged from 20.1 mg/kg at location DP02 to 11,700 mg/kg at location DP04. Only two samples exceed the clean up goal of 800 mg/kg for lead (DP01 and DP04). PCBs were analyzed at two sample locations (RS03 and RS04, located south of the Access Road close to Oceana Blvd.) One PCB (Arochlor-1260) was detected in both samples at concentrations of 0.012J mg/kg and 0.014J mg/kg, respectively. These concentrations were less than the Resource Conservation and Recovery Act (RCRA) screening value of 50 mg/kg.

Property Boundary Survey and Sampling

Michael Surveying and Mapping located and marked the property boundary between the Navy and Oceana Salvage Yard properties. The survey report is included as **Attachment B**. While the wire fence generally follows the property line, the fence is located a few feet onto the Navy property in some locations, particularly in the southern portion of the site, as shown on **Figure 3**. In order to evaluate contamination on Navy property along the fence line, the perimeter of the site was divided into 19 100-foot long sections and composite samples were collected from three locations within each 100-foot interval. The first sample (LP-01) was collected from the northern end of the property boundary and the last sample (LP-19) was collected at the interval closest to the Northern portion of the Access Road.

Soil samples from each of these sections were collected from 0 to 2 feet bgs (or until refusal) using a stainless steel hand auger. The three samples from each section were composited and homogenized in a stainless steel bowl. The property boundary composite soil samples were placed in laboratory-prepared sample containers and packed on ice for shipment to the offsite laboratory for lead analysis (method SW846 6010B).

Results of property boundary samples are shown on **Table 3** and **Figure 3**. Concentrations ranged from 18.8 mg/kg to 1700 mg/kg, with the highest concentrations at the intervals closest to the Access Road.

References

CH2M HILL. 2010. *Oceana Salvage Yard Access Road Confirmation Sampling, Naval Air Station Oceana, Virginia Beach, Virginia*. November.

CH2M HILL. 2011. *Final Technical Memorandum Work Plan: Oceana Salvage Yard Burial Unit and Debris Pile Sampling Plan, Naval Air Station Oceana, Virginia Beach, Virginia*. April.

United States Environmental Protection Agency (USEPA). 2007. *Draft Administrative Settlement and Order on Consent for Removal Response Action, Oceana Salvage Yard Site, Docket No. CERC-03-2007-0130DC*.

USEPA. 2008. *Final Administrative Settlement and Order on Consent for Removal Response Action, Oceana Salvage Yard Site, Docket No. CERC-03-2007-0130DC*. September.

Tables

Table 1
 Burial Unit Analytical Results
 Naval Air Station Oceana
 Virginia Beach, Virginia

Sample ID	OSAL-SO36-0311	OSAL-SO37-0311	OSAL-SO38-0311	OSAL-SO39-0311	OSAL-SO40-0311	OSAL-SO41-0311	OSAL-SO42-0311	OSAL-SO43-0311	OSAL-SO44-0311	OSAL-SO45-0311	OSAL-SO46-0311
Sample Date	3/28/11	3/29/11	3/28/11	3/29/11	3/28/11	3/29/11	3/28/11	3/29/11	3/28/11	3/29/11	3/28/11
Chemical Name											
Total Metals (MG/KG)											
Lead	1,250 DQ	384 D	558 D	893 D	2,960 D	100	1,040 D	897 D	3,680 D	3,890 D	4,530 D

Notes:

Shading indicates detection

D - Compound identified in an analysis at a secondary dilution factor.

DQ - See 'D' and 'Q'

instrument

EQ - See 'E' and 'Q'

NS - Not sampled

control limits.

MG/KG - Milligrams per kilogram

Table 1
 Burial Unit Analytical Results
 Naval Air Station Oceana
 Virginia Beach, Virginia

Sample ID	OSAL-SO47-0311	OSAL-SO48-0311	OSAL-SO49-0311	OSAL-SO50-0311	OSAL-SO51-0311	OSAL-SO52-0311	OSAL-SO53-0311	OSAL-SO54-0311	OSAL-SO56-0311
Sample Date	3/29/11	3/28/11	3/29/11	3/28/11	3/29/11	3/28/11	3/29/11	3/28/11	3/28/11
Chemical Name									
Total Metals (MG/KG)									
Lead	2,630 D	4,260 D	2,690 D	4,670 D	7,580 D	5,210 D	18,900 D	8,590 D	8,100 D

Notes:

Shading indicates detection
 D - Compound identified in an a
 DQ - See 'D' and 'Q'
 instrument
 EQ - See 'E' and 'Q'
 NS - Not sampled
 control limits.
 MG/KG - Milligrams per kilogran

TABLE 2

Debris Pile Descriptions
 Naval Air Station Oceana
 Virginia Beach, Virginia

Debris Pile Identification	Location	Description of Contents	Estimated Dimensions (feet)	Photos Taken
1	South of Access Road Entrance	metal, barbed wire fencing, concrete pipe, wood, plastic, metal, hood of car, food wrappers, cardboard, plastic car components, bricks, concrete debris, carpet, glass bottles, other miscellaneous car parts, battery fragments, and oil filters	67' x 74' x 2.5'	1-16
2	East of Debris Pile 1	scrap metal, plastic bottles, concrete blocks, fiberglass insulation, tires, fishtank, pipe insulation, small empty oil containers, old rags, plastic liners, trash bags, chair, glass bottles, car parts, electronics (T.V., air conditioner, fan, etc.), filter fabric	205' x 45' x 2'	17-48
3	Along north side of road	battery casings, tires, glass bottles, metal debris, asphalt, bricks, scrap metal, fan, canvas, household appliances, tires, couch, carpet, electrical wires, radiator, hose, concrete pieces, timber, transmission, gas tanks, paint cans, empty buckets labeled, "joint compound," asphalt, wire, rubber hoses, oil filters	275' x 75' x 2.5'	77-107
4	East of Debris Pile 3	scrap lumber, tires, spools of wire, metal pieces, car parts (mufflers, oil filters, bumpers, truck bed, etc), concrete, bench seat from car, battery casings, bottles, cans, carpet, hoses, bricks, Exide batteries	425' x 85' x 4'	143-176
Surficial Debris - South of Access Road		battery fragments, tires, metal spools, plastic bottles	380' x 35' x 0.5'	49-76
Surficial Debris - North of Access Road		scrap lumber, tires, spools of wire, bottles, cans, carpet, hoses, paint cans, possible asbestos containing materials	380' x 15' x 0.5'	108-142

Notes

Photographs 176-189 were taken of the property boundary (Attachment A)

Table 3
 Debris Pile and Property Boundary Analytical Sample Results
 Naval Air Station Oceana
 Virginia Beach, Virginia

Sample ID	OSAL-DP01-0411	OSAL-DP02-0411	OSAL-DP03-0411	OSAL-DP04-0411	OSAL-DP05-0411	OSAL-DP06-0411	OSAL-DP07-0411	OSAL-LP01-0511	OSAL-LP02-0511	OSAL-LP03-0511	OSAL-LP04-0511
Sample Date	4/28/11	4/28/11	4/28/11	4/28/11	4/28/11	4/28/11	4/28/11	5/3/11	5/3/11	5/3/11	5/3/11
Chemical Name											
Pesticide/Polychlorinated Biphenyls (MG/KG)											
Aroclor-1260	NS										
Total Metals (MG/KG)											
Lead	5,590 DQ	20.1	376 D	11,700 D	65.7	114	27.2	22.3	22.1	18.8	40.5

Notes:
 Shading indicates detection
 D - Compound identified in an analysis at a secondary dilution factor.
 DQ - See 'D' and 'Q'
 E - Concentration exceeds calibration range of instrument
 EQ - See 'E' and 'Q'
 J - Analyte present. Value may or may not be accurate or precise
 NS - Not sampled
 Q - One or more quality control criteria were outside control limits.
 U - The material was analyzed for, but not detected
 MG/KG - Milligrams per kilogram

Table 3
 Debris Pile and Property Boundary Analytical Sample Results
 Naval Air Station Oceana
 Virginia Beach, Virginia

Sample ID	OSAL-LP05-0511	OSAL-LP06-0511	OSAL-LP07-0511	OSAL-LP08-0511	OSAL-LP09-0511	OSAL-LP10-0511	OSAL-LP11-0511	OSAL-LP12-0511	OSAL-LP13-0511	OSAL-LP14-0511	OSAL-LP15-0511
Sample Date	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11	5/3/11
Chemical Name											
Pesticide/Polychlorinated Biphenyls (MG/KG)											
Aroclor-1260	NS										
Total Metals (MG/KG)											
Lead	18.9	21.2	47.8	73.5	74.9	267 D	32.5	267 D	86.5	326 D	111

Notes:

- Shading indicates detection
- D - Compound identified in an analysis at a secondary dilution factor.
- DQ - See 'D' and 'Q'
- E - Concentration exceeds calibration range of instrument
- EQ - See 'E' and 'Q'
- J - Analyte present. Value may or may not be accurate or precise
- NS - Not sampled
- Q - One or more quality control criteria were outside control limits.
- U - The material was analyzed for, but not detected
- MG/KG - Milligrams per kilogram

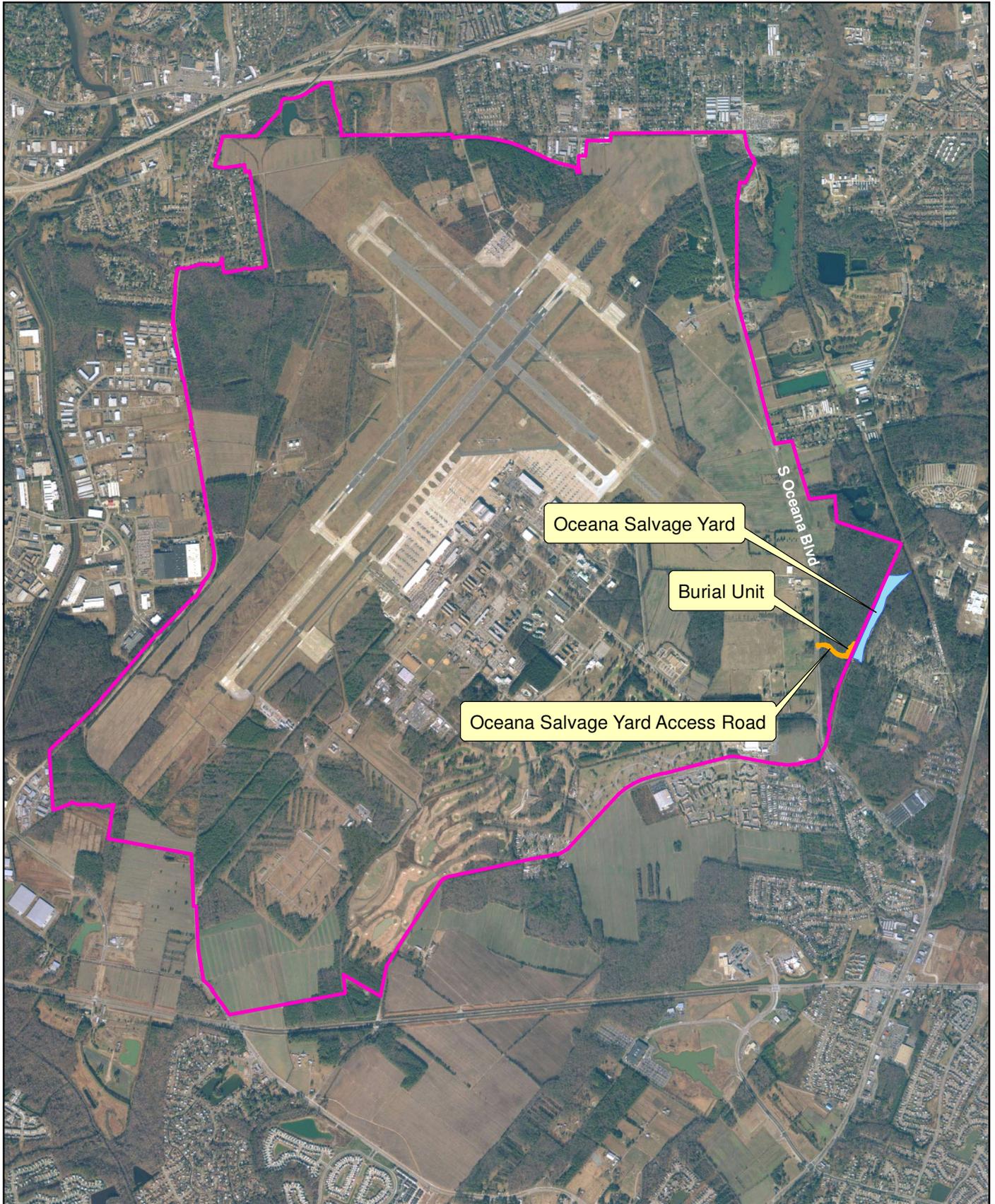
Table 3
 Debris Pile and Property Boundary Analytical Sample Results
 Naval Air Station Oceana
 Virginia Beach, Virginia

Sample ID	OSAL-LP16-0511	OSAL-LP17-0511	OSAL-LP18-0511	OSAL-LP19-0511	OSAL-RS01-0411	OSAL-RS02-0411	OSAL-RS03-0411	OSAL-RS04-0411
Sample Date	5/3/11	5/3/11	5/3/11	5/3/11	4/28/11	4/28/11	4/28/11	4/28/11
Chemical Name								
Pesticide/Polychlorinated Biphenyls (MG/KG)								
Aroclor-1260	NS	NS	NS	NS	NS	NS	0.012 J	0.014 J
Total Metals (MG/KG)								
Lead	457 D	236 D	1,070 D	1,700 D	785 D	249 D	131 D	102

Notes:

- Shading indicates detection
- D - Compound identified in an analysis at a secondary dilution factor.
- DQ - See 'D' and 'Q'
- E - Concentration exceeds calibration range of instrument
- EQ - See 'E' and 'Q'
- J - Analyte present. Value may or may not be accurate or precise
- NS - Not sampled
- Q - One or more quality control criteria were outside control limits.
- U - The material was analyzed for, but not detected
- MG/KG - Milligrams per kilogram

Figures



Legend

-  NAS Oceana Boundary
-  Access Road and Burial Unit
-  Oceana Salvage Yard



Figure 1
Site Map
NAS Oceana
Virginia Beach, Virginia



Legend
 - NAS Oceana Boundary
 - Burial Unit Boundary
 - Grid Cell
 - Impacted Area (Lead in Soil > 800 mg/kg)
 897 - Detected Lead Concentration

Notes:
 Samples SO01 through SO33 collected October 2010.
 Samples SO55 and SO57 not collected due to overlap with SO16.
 Lead contamination is delineated within the boundary of the burial unit and access road shoulders as specified in the 2007 draft consent order.

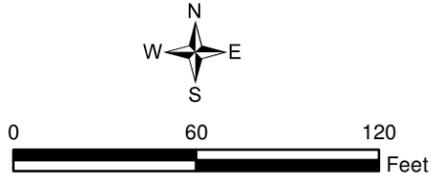
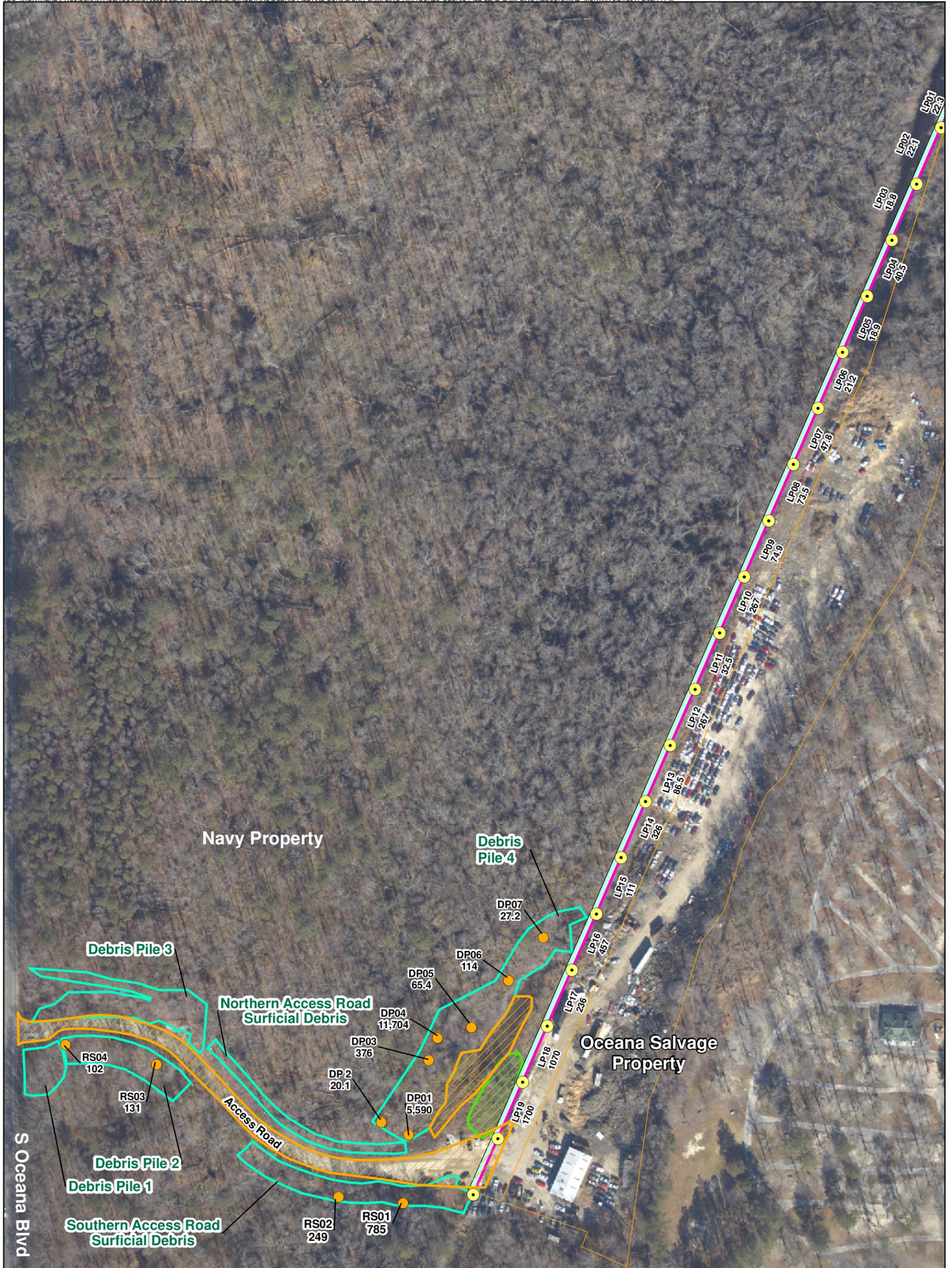


Figure 2
 Access Road Shoulder and Burial Unit
 Lead Sampling Results
 NAS Oceana
 Virginia Beach, Virginia



- Legend**
- Survey Stakes
 - Discrete Soil Sample Location
 - NAS Oceana Property Boundary
 - Extent of Proposed Removal Action per 2007 Draft Consent Order
 - Approximate Locations of Debris Piles/Surficial Debris
 - Approximate Location of Casing Removal Project (ABB, 1997)
 - Approximate Oceana Salvage Yard Parcel Boundaries (City of Virginia Beach)

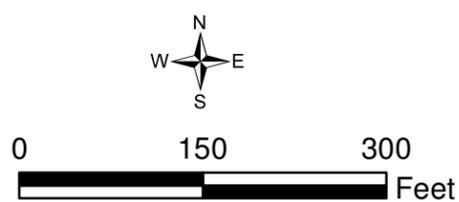


Figure 3
Property Boundary Survey and Debris Pile
Lead Sampling Results
NAS Oceana
Virginia Beach, Virginia

Attachments

Attachments A and B are provided electronically on the attached CD-ROM.

