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WORK PLAN ADDENDA
FOR
NAVAL SURFACE WARFARE CENTER
STUMP NECK ANNEX, INDIAN HEAD DIVISION
INDIAN HEAD, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Chesapeake
Environmental Branch Code 18
Naval Facilities Engineering Command
Washington Navy Yard, Building 212
Washington, D.C. 20374-2121

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1.0 INTRODUCTION

This section is acceptable as presented in the RCRA Facility Investigation (RFI) and Verification Investigation (VI) Work Plans prepared by EnSafe/Allen & Hoshall in 1995. (The Work Plans prepared by EnSafe/Allen & Hoshall will be referred to as the EnSafe Work Plans throughout the remainder of this narrative.) Brown & Root Environmental proposes no changes or addenda for this section.

2.0 SITE BACKGROUND INFORMATION

This section is acceptable as presented in the RFI and VI Work Plans prepared by EnSafe in 1995. Brown & Root Environmental proposes no changes or addenda for this section.

3.0 SOLID WASTE MANAGEMENT UNITS

This section is acceptable as presented in the RFI and VI Work Plans prepared by EnSafe in 1995. Brown & Root Environmental proposes no changes or addenda for this section.

SECTION 4A

RFI FIELD SAMPLING PLAN

4.0A FIELD SAMPLING PLAN

The format of the EnSafe Field Sampling Plan (FSP) in the RFI Work Plan (RFIWP) has been adopted for this FSP addendum to maintain consistency between the documents. Only sections requiring additions or revisions have been included in this Addendum. In addition, investigative matrix summary tables have been provided to ensure continuity between the original FSP and this addendum.

4.1 DUMP SITE A/RANGE 3 BURN POINT

An investigative matrix is provided in Table 4A-4 which summarizes the environmental media to be sampled, sampling rationale, investigative techniques, sampling locations, maximum number of samples to be collected and chemical analyses at Dump Site A/Range 3. Figure 8A is provided to illustrate additional sampling locations.

Soil Gas Survey

A soil gas survey will be performed at the site to 1) better define the Site boundary and 2) identify volatile organic chemical (VOC) hot spots targeted for soil sampling and monitoring well location. Soil gas samples will be collected following procedures described in Section 5.1 of this addendum and Section 5.1 of the EnSafe RFIWP. A soil gas reference grid will be established at the site. The grid will be staked at a constant interval of 50 feet with a total number sampling points of 50 (5 point by 10 point grid). The grid dimensions may vary as actual field conditions may prohibit the installation of a soil gas sampling point(s). The grid will be marked using the Global Positioning Satellite (GPS), electronic distance measure (EDM) or tape measure. Stakes will consist of pin flags or other semipermanent markings, labeled with the grid coordinates in units of feet.

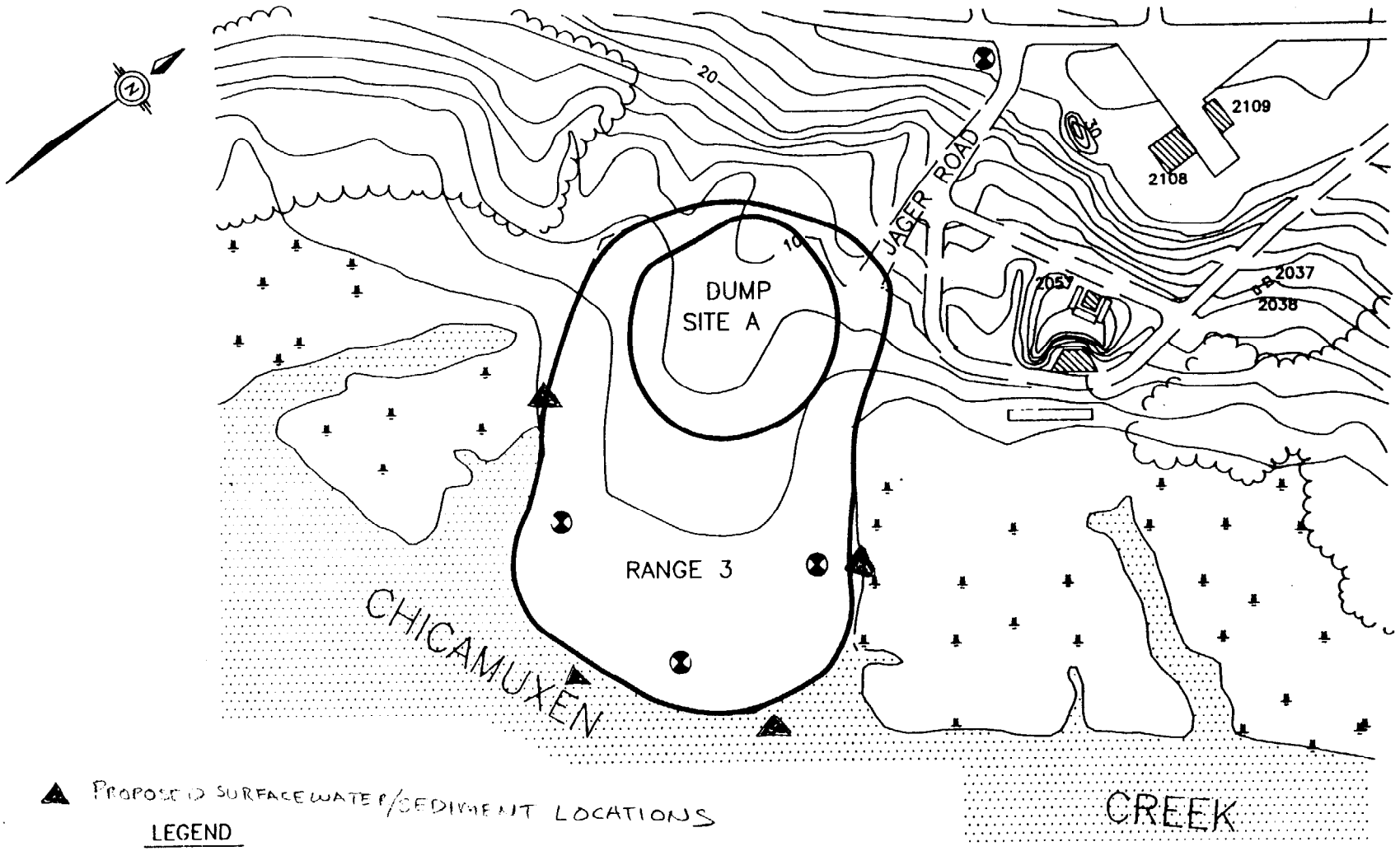
Monitoring Well Installation/Soil boring

Split spoon soil sampling for lithologic description will be performed as specified in the EnSafe RFIWP with the following changes. When the water table is encountered, split spoons will be collected at 5-foot intervals to 7-feet below the water table. A maximum of two subsurface soil samples will be collected from each monitoring well boring for a total of 8 samples. Head space field screening (see Section 5.5) will be implemented to assist in selection of samples to be sent for base laboratory analysis. The target depths for samples for analysis are the middle and bottom of the boring above the water table. ?

TABLE 4A-4

INVESTIGATIVE MATRIX
DUMP SITE A/RANGE 3 BURN POINT
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Media/Rationale	Investigative Techniques	Locations	Maximum Number of Samples	Analysis
GROUNDWATER - To determine if the shallow groundwater has been affected be site activities. And to characterize the hydrogeology.	Install 4 monitoring wells Collect groundwater samples for chemical analysis and obtain water level measurements from the newly installed monitoring wells.	Locations for the one upgradient and three downgradient monitoring wells will be determined in the field. Ensafe RFIWP Fig. 8 shows 4 locations. The locations may be changed based on terrain.	4 groundwater samples.	Appendix IX metals, VOA, SVOA. Explosives TOC, TOX, and pH.
SOILS - To determine the nature and extent of contamination.	Surface soil field test kits performed on a 50 ft. spacing grid.	Collected at 0 to 2 feet depth. at grid points.	Approximately 60 field test kits, 50 soil points on grid plus 10 at suspected hot spots.	Explosives and TPH
	4 well borings to the water table Obtain subsurface soil samples for chemical analysis and split spoon continuously during well installation for geological purposes.	Well borings located as stated above. Collect soil samples from two depths middle and lower portion of the boring above the water table.	18 subsurface soil samples for analysis; 8 samples from the well borings, and 10 subsurface soil samples from the hand auger borings.	Appendix IX metals, VOA, SVOA. Explosives TOC, TOX, and pH.
	Shallow soil borings.	Ten shallow soil boring locations with hand auger, based on field test kit results.	A total of 14 surface soil samples: 4 from the well boring locations, and 10 from the hand auger boring locations	
	Reconnaissance-type soil gas survey on a 50 ft. spacing grid designed to aid in the positioning of the proposed monitoring wells and surface soil collection	One surface soil sample from each well boring locations.		
		Survey grid throughout the site	50 points on a 50 ft spacing grid.	
SURFACE WATER AND SEDIMENT - To determine if the nearby surface water and sediments has been affected be site activities.	Collect surface water and sediment samples starting downstream proceeding upstream. Use ponar dredge in Chicamuxen Creek.	Collect one from streams east and west of the site and two from Chicamuxen Creek.	4 surface water and sediment samples	Appendix IX metals, VOA, SVOA. Explosives TOC, TOX, and pH.



▲ PROPOSED SURFACE WATER/SEDIMENT LOCATIONS

LEGEND

- MARSH
- PAVED ROAD
- UNPAVED ROAD
- BUILDING
- 2' CONTOUR
- WOODED AREA
- MONITORING WELL
- SITE
- WATER

SOURCE: USN BUREAU OF YARDS AND DOCKS
AREA PUBLIC WORKS OFFICE, CHESAPEAKE
WASHINGTON, D.C. DWG. 1029298

150 0 150
SCALE FEET

RCRA FACILITY INVESTIGATION
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

FIGURE 8A
RANGE 3 BURNPOINT
DUMP SITE A
PROPOSED WELL LOCATIONS

DATE: 09/13/95 | DWG NAME: 4BDSWL2

In addition, ten soil borings will be installed at locations identified by field test kit results and the soil gas survey. The soil borings will be installed using a hand auger to a shallow depth of approximately 4 to 5 feet below the ground surface.

The Shelby tube samples will not be collected as part of this investigation. ?

Water Level Measurement

One round of synoptic groundwater level measurements will be performed at all newly installed monitoring wells.

Groundwater sampling

The four newly installed wells will be sampled using procedures described in this document in Section 5.10 and Section 5.10 of the FSP

Surface Soil Sampling

Field test kits will be used to screen surface soil samples, to identify potential hot spots, and to better define the extent of contamination at the site. A sampling grid will be established. The grid will be staked at a constant interval of 50 feet and the total number of sampling points will be 50 (i.e., 5 point by 10 point grid). The grid dimensions may vary as actual field conditions may prohibit the collection of a surface soil sample. Ten additional screening samples may be collected to further define hot spots identified by initial sampling. All screening soil samples will be collected from 0 to 2 feet below ground surface (bgs) and analyzed with field test kits for trimethylenetrinitramine (RDX), cyclotetramethylene tetranitramine (HMX), 2,4,6-trinitrotoluene (TNT), and TPH. An EOD specialist will be present during sampling.

A total of 14 surface soil samples will be collected and sent to a fixed-base laboratory for analysis. One will be collected at each of the four well boring locations and ten will be collected using a hand auger. Soil boring locations will be determined based on the results of the field test kits and the soil gas survey. The decision making process will include the field geologist, B&R Environmental project manager and the Navy Personnel.

Samples for all analytes except VOCs will be collected from 0 to 1 foot bgs depth interval; samples collected from 0.5 to 1 foot bgs will be analyzed for VOCs.

Surface Water and Sediment Sampling

Surface water and sediment samples will be collected at four locations. The streams to the west and east of Range 3 and 2 locations in Chicamuxen Creek will be sampled. Figure 8A is provided to illustrate the proposed surface water/sediment sampling locations.

4.2 RANGE 6 SAMPLE LOCATION AND RATIONAL

An investigative matrix summary is provided in Table 4A-5 summarizing the environmental media sampled, sampling rationale, investigative techniques, sampling locations, target analytes and maximum number of samples to be collected at Range 6. Figure 9A is provided to illustrate additional sampling locations.

Soil Gas Survey

A soil gas survey will be performed at Range 6 to: 1) better define the site boundary, and 2) identify hot spots for soil sampling and monitoring well location. Soil gas samples will be collected following procedures described in Section 5.1 of this addendum and Section 5.1 of the EnSafe RFIWP. A soil gas reference grid will be established at the site. The grid will be staked at a constant interval of 100 feet; the total number of sampling points will be 50 (i.e., 5 point by 10 point grid). The grid dimensions may vary as actual field conditions may prohibit the installation of a soil gas sampling point(s). The grid will be marked using the GPS, EDM, or tape measure. Stakes will consist of pin flags or other semipermanent markings, labeled with the grid coordinates in units of feet.

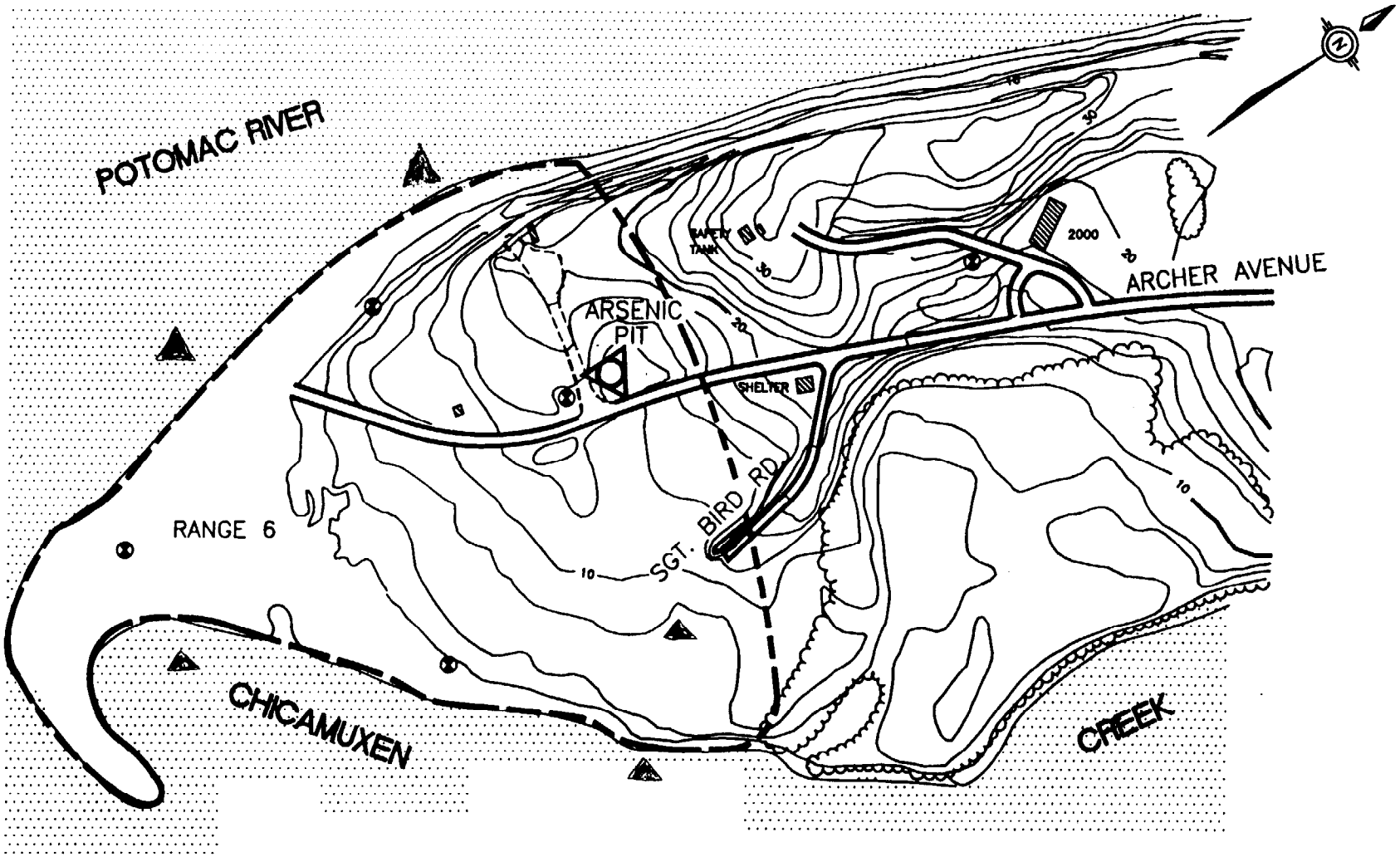
Monitoring Well Installation/Soil boring

The EnSafe RFIWP (1991) proposed the installation of 5 monitoring wells. Because one monitoring well was installed by Brown & Root Environmental in 1995 under CTO 222, only four additional monitoring wells will be installed as shown in Figure 9A. Split spoon soil sampling for lithologic description will be performed as specified in the EnSafe RFI WP with the following changes: when the water table is encountered, split spoons will be collected at 5-foot intervals to 7-feet below the water table. A maximum of two subsurface soil samples will be collected from the 4 monitoring wells (a total of 8 subsurface soil samples) and sent to a fixed-base laboratory for analysis. Head space field screening (see Section 5.5) for VOCs will be performed to assist in selection of samples for laboratory analysis. In the absence of significant positive VOC readings or other evidence of contamination, subsurface soil samples for fixed-base lab analysis will be collected at a mid-depth point between the ground surface and the top of the

TABLE 4A-5

INVESTIGATIVE MATRIX
RANGE 6
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Media/Rationale	Investigative Techniques	Locations	Maximum Number of Samples	Analysis
GROUNDWATER - To determine if the shallow groundwater has been affected be site activities. And to characterize the hydrogeology	Install four monitoring wells. Collect groundwater samples for chemical analysis and obtain water level measurements from all monitoring wells.	The location for the newly installed monitoring wells are depicted in the Ensafe RFI WP.	Five groundwater samples. Four newly installed and one existing well.	Appendix IX metals, VOA, SVOA. Explosives.
SOILS - To determine the vertical horizontal extent of the landfill and to identify VOC hot spots.	Collect subsurface soil samples for chemical analysis from 4 monitoring well borings. And split spoon continuously during well installation geological purposes.	Collect subsurface soil samples from two depths middle and lower portion of the well boring above the water table.	23 subsurface soil samples: 8 samples from the well borings and 15 subsurface samples collected from the hand auger borings.	Appendix IX metals, VOA, SVOA. Explosives.
		Collect one subsurface soil from each hand auger boring at 10 locations in 5 ranges (2 per range) and 5 locations outside the ranges.		
	Shallow soil borings.	Collect one surface soil from each hand auger boring at 10 locations in 5 ranges (2 per range) and 5 locations outside the ranges and from each well boring.	19 surface soil samples: 15 surface soil samples at the hand auger boring locations and 4 at well boring locations.	
	Reconnaissance-type soil gas survey on a 100 ft spacing grid designed to aid in the positioning of the proposed monitoring wells and surface soil collection.	A soil gas grid throughout the site.	50 grid points	
SURFACEWATER AND SEDIMENT - To determine if the nearby surfacewater and sediments has been affected be site activities.	Collect surface water and sediment samples starting downstream proceeding upstream. Ponar dredge used to collect sediments. Kemmerer sampler used to collect deeper surface waters.	Two locations at Potomac River and two at Chicamuxen Creek and if it occurs, one at the surface drainage.	Five surface water and ten sediment samples.	Appendix IX metals, VOA, SVOA. Explosives.



LEGEND

- MARSH
- PAVED ROAD
- UNPAVED ROAD
- BUILDING
- 10' CONTOUR
- 2' CONTOUR
- WOODED AREA
- MONITORING WELL
- ARSENIC PIT
- WATER
- PROPOSED SURFACE WATER/SEDIMENT LOCATION

200 0 200
SCALE FEET

SOURCE: USN BUREAU OF YARDS AND DOCKS
AREA PUBLIC WORKS OFFICE, CHESAPEAKE
WASHINGTON, D.C. DWG. 1029298

RCRA FACILITY INVESTIGATION
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

FIGURE 9A
RANGE 6
PROPOSED WELL LOCATIONS

DATE: 10/09/95 | DWG NAME: 4R6SMSL2

water table and at the soil interval just above the water table. Shelby tube samples will not be collected as part of this investigation.

In addition, 15 shallow hand auger soil borings will be installed at 10 locations inside the 5 ranges and 5 locations out side the ranges. Soil borings will be located based on historical information available for the SWMU, analytical results available as a result of the Verification Investigation conducted by Brown & Root Environmental in 1995, field screening results and visual evidence of contamination. One shallow subsurface soil sample will be collected from each soil boring location for a total of 15 shallow subsurface soil samples. (Surface soil samples will be collected at each location as discussed in subsequent paragraphs.) The soil borings will be installed using a hand auger to a total depth of approximately 4 to 5 feet below the ground surface. In the absence of significant VOC readings or other evidence of contamination, the shallow subsurface soil samples will be a composite of soil collected in the 1 to 4 foot bgs interval.

Water Level Measurement

One round of synoptic groundwater level measurements will be performed at all newly installed monitoring wells.

Groundwater Sampling

The four newly installed wells and the existing monitoring well will be sampled using procedures detailed in this document in Section 5.10 and Section 5.0 of EnSafe RFIWP.

Surface Soil Sampling

A total of 19 surface soil samples will be collected. Fifteen samples will be collected at the aforementioned soil boring locations using a hand auger. Surface soil samples will also be collected at each of the four monitoring well locations. Proposed sampling locations will be reviewed with the Navy prior to actual sample collection.

Samples for all analytes except VOCs will be collected at 0 to 1 foot bgs; soil samples collected at 0.5 to 1 foot bgs will be analyzed for VOCs.

Surface Water and Sediment Sampling

Surface water and sediment samples will be collected at five locations. Samples will be collected at two locations in the Potomac River and at two locations in Chicamuxen Creek. If a surface drainage swale exists on the site, surface water/sediment samples will be collected at an upstream location. A second surface water/sediment sample will be collected from the swale area just as it drains into the Potomac River or Chicamuxen Creek. Proposed surface water/sediment sampling locations are shown in Figure 9A.

4.3 AQUIFER TESTING

A slug test will be performed at each newly installed and existing monitoring well..

4.5 HORIZONTAL AND VERTICAL SURVEY

All new groundwater wells, soil borings, and surface water/sediment sample locations will be surveyed. The top of the well riser pipe, the top of the protective casing, and the ground surface elevation at each well will be surveyed to within 0.01-foot vertical accuracy. In addition, all locations will be surveyed to a 0.1-foot horizontal accuracy. Existing survey monuments within Stump Neck Annex will be used as reference points. Horizontal locations will be tied into the State Plane coordinates. Vertical elevations will be referenced to 1929 North American Datum.

SECTION 4B

VI FIELD SAMPLING PLAN

4.0B FIELD SAMPLING PLAN

The format of the EnSafe Field Sampling Plan (FSP) in the VI Work Plan (VIWP) has been adopted for this FSP addendum to maintain consistency between the documents. Only sections requiring additions or revisions have been included in this Addendum. In addition, investigative matrix summary tables have been provided to ensure continuity between the original FSP and this addendum.

4.1 RUM POINT LANDFILL SAMPLE LOCATIONS AND RATIONALE

An investigative matrix summary is provided in Table 4A-1 and summarizes the environmental media to be sampled, sample rationale, investigative techniques, sampling locations, chemical analyses, maximum number of samples to be collected at Rum Point Landfill. Figure 9A is provided to illustrate additional sampling locations.

Soil Gas Survey

A soil gas survey will be performed at the Rum Point Landfill to: 1) better define the landfill boundary, and 2) identify volatile organic chemical (VOC) hot spots for soil sampling and monitoring well location. Soil gas samples will be collected following procedures described in Section 5.1 of this addendum and the EnSafe VIWP Section 5.1. A soil gas reference grid will be established at the site. The grid will be staked at a constant interval of 50 feet; the total number of sampling points will be 25 (5 point by 5 point grid). The grid dimensions may vary as actual field conditions may prohibit the installation of a soil gas sampling point(s). The grid will be marked using the Global Positioning Satellite (GPS), electronic distance measure (EDM) or tape measure. Stakes will consist of pin flags or other semipermanent markings, labeled with the grid coordinates in units of feet.

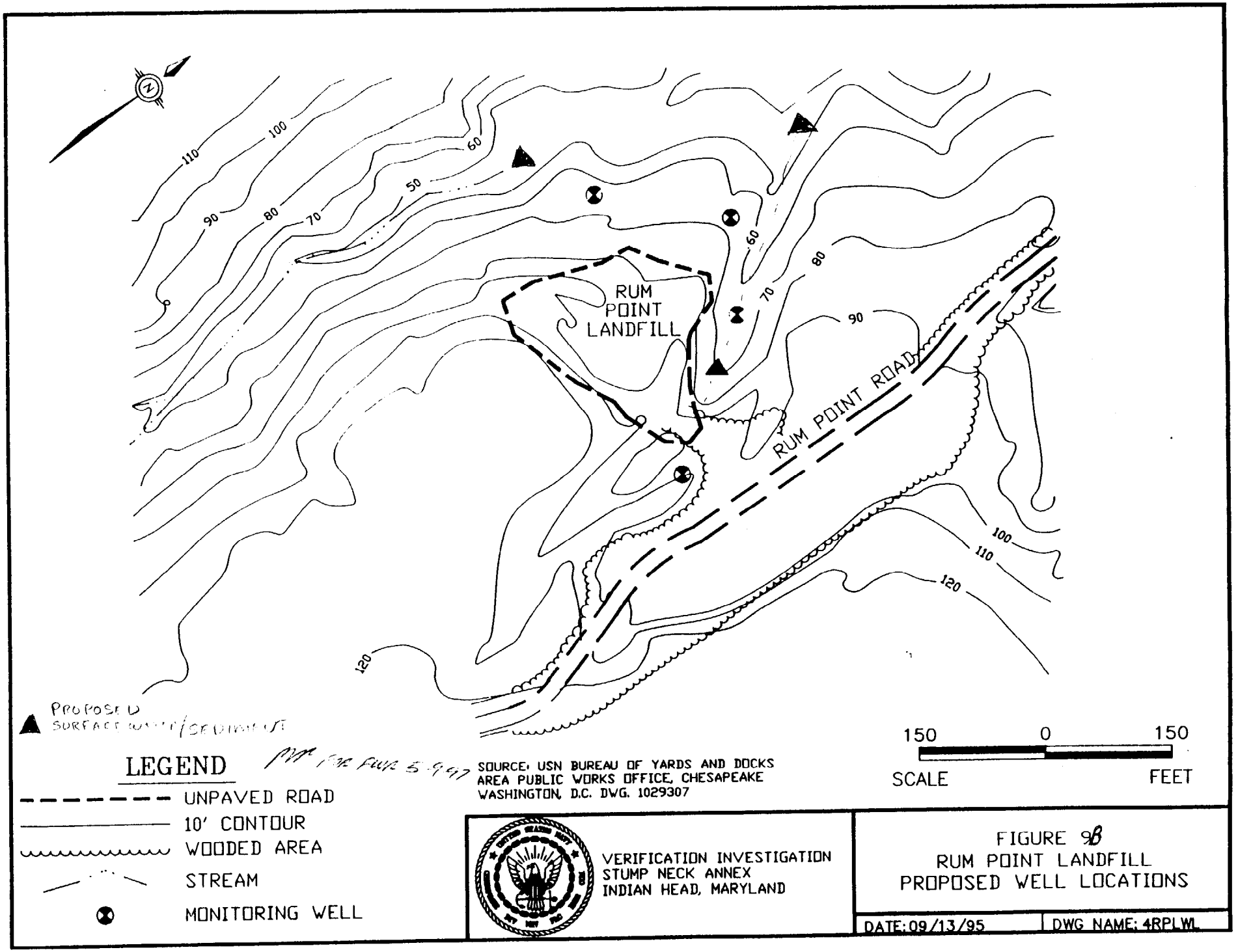
Monitoring Well Installation/Soil Boring

Split spoon soil sampling for lithologic description will be performed as specified in the EnSafe VIWP with the following changes: When the water table is encountered, split spoons will be collected at 5-foot intervals to 7-feet below the water table. A maximum of two subsurface soil samples will be collected from each monitoring well boring for a total of 8 samples and sent to a fixed-base lab for analysis. Head space field screening (see Section 5.5) will be performed to assist the field sampler in selecting samples to be sent for fixed-base analysis. In the absence of significant positive VOC readings or other evidence of

TABLE 4A-1

INVESTIGATIVE MATRIX
RUM POINT LANDFILL
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Media/Rationale	Investigative Techniques	Locations	Maximum Number of Samples	Analysis
GROUNDWATER - To determine if the shallow groundwater has been affected be site activities. And to characterize the hydrogeology of the site	Install 4 monitoring wells. Collect groundwater samples for chemical analysis and obtain water level measurements from the newly installed monitoring wells.	The location for the newly installed monitoring wells are depicted in the Ensafe VI WP. The locations may be moved based on the soil gas survey results.	4 groundwater samples.	Appendix IX metals, VOA, SVOA.
SOILS - To determine the vertical horizontal extent of the landfill and to identify VOC hot spots.	Collect subsurface soil samples for chemical analysis from 4 monitoring well borings. And split spoon sample continuously during well installation for lithological description.	Collect soil samples from two depths mid and lower portion of the boring above the water table.	8 subsurface soil samples; 2 samples from each monitoring well boring.	Appendix IX metals, VOA, SVOA.
	Collect surface soil samples	Collect surface soil samples from each well boring locations.	4 surface soil samples at the well locations. 4 composite samples throughout the landfill.	
	Reconnaissance-type soil gas survey on a 50 ft spacing grid designed to aid in the positioning of the proposed monitoring wells and surface soil collection.	Soil gas survey grid throughout the site.	25 soil gas points.	
SURFACE WATER AND SEDIMENT - To determine if the nearby surface water and sediments have been affected be site activities.	Collect surface water and sediment samples starting downstream proceeding upstream.	Locations at stream adjacent to landfill and downstream	3 surface water and 3 sediment samples (1 sediment and 1 surface water are background)	Appendix IX metals, VOA, SVOA.


RUM POINT LANDFILL
RUM POINT ROAD
110
100
90
80
70
60
50
60
70
80
90
100
110
120
120
PROPOSED SURFACE WATER/SEDIMENT
LEGEND
UNPAVED ROAD
10' CONTOUR
WOODED AREA
STREAM
MONITORING WELL
SOURCE: USN BUREAU OF YARDS AND DOCKS AREA PUBLIC WORKS OFFICE, CHESAPEAKE WASHINGTON, D.C. DWG. 1029307
150 0 150
SCALE FEET
VERIFICATION INVESTIGATION
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND
FIGURE 9B
RUM POINT LANDFILL
PROPOSED WELL LOCATIONS
DATE: 09/13/95
DWG NAME: 4RPLWL

contamination, subsurface soil samples for fixed-base lab analyses will be collected at the mid-depth point between the ground surface and the top of water table and at the soil interval just above the water table.

Water Level Measurement

One round of synoptic groundwater level measurements will be performed at all newly installed monitoring wells.

Groundwater Sampling

The four newly installed wells will be sampled as per procedures detailed in Section 5.0 of this addendum and Section 5.0 of the EnSafe VIWP.

Surface Soil Sampling

One surface soil sample will be collected at each monitoring well location for a total of four surface soil samples collected for fixed-base laboratory analysis. Samples for all analytes except VOCs will be collected at 0 to 1 foot bgs; soil samples collected at 0.5 to 1.0 foot bgs will be analyzed for VOCs. In addition, four composite surface soil samples shall be collected within the landfill boundaries. The specific locations will be based on the soil gas survey results and visual evidence of contamination. Locations will be finalized through discussions between the Navy and B&R Environmental personnel.

Surface Water and Sediment Sampling

At a minimum, surface water/sediment samples will be collected at two locations: one in the stream to the west of the site and one in the same stream further downstream beyond the confluence with the drainage swale northeast of the site. In addition, one sediment sample will be collected from drainage swale if found at the site. Figure 9A is provided to illustrate the proposed surface water/sediment sampling locations.

4.2 AIR BLAST POND SAMPLE LOCATIONS AND RATIONALE

An investigative matrix summary is provided in Table 4A-2 summarizing the environmental media to be sampled, sampling rationale, investigative techniques, sampling locations, chemical analyses and maximum number of samples to be collected at the Air Blast Pond.

TABLE 4A-2

INVESTIGATIVE MATRIX
AIR BLAST POND
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Media/Rationale	Investigative Techniques	Locations	Maximum Number of Samples	Analysis
SOILS - To determine the nature and vertical and horizontal extent of the contamination.	Surface soil field test kits performed on a 50 ft spacing grid. 4 soil borings to the water table. Collect subsurface soil samples for chemical analysis and split spoon continuously for lithologic purposes. Collect surface soil samples	Collected at 0 to 2 feet depth at grid points. Soil boring around the perimeter of the site. Collect soil samples from three horizons top, mid and lower portion of the boring above the water table. Surface soil sample locations in side pond to be determined by the field test kit results.	Approximately 50 field test kit soil points. 12 subsurface soil samples for analysis; 3 samples from each soil boring. 3 surface soil samples from inside the pond.	RDX, HMX, TNT. Appendix IX metals, VOA, SVOA. Explosives.
SURFACE WATER AND SEDIMENT - To determine if the nearby surface water and sediments has been affected be site activities.	Collect surface water and sediment samples starting downstream proceeding upstream.	3 sediment samples collected from the effluent ditch and 1 sediment collected from the IW32. And 1 surface water collected from the influent ditch.	1 surface water and 4 sediment samples.	Appendix IX metals, VOA, SVOA. Explosives.

Surface Soil Sampling

The results of field screening for explosives will be used to select the locations for the three surface soil samples to be collected from the area within the former blast pond.

Field test kit screening will be used to identify potential hot spots and define the extent of contamination, if any. A surface soil sample reference grid will be established at the site. The grid will consist of 50 feet spacings; the total number of sampling points will be 50 (5 point by 10 point grid). The grid dimensions may vary as actual field conditions may prohibit the collection of a surface soil sample. The soil samples will be collected from 0 to 2 feet bgs at each sampling point and analyzed in the field with test kits for trimethylenetrinitramine (RDX), cyclotetramethylene tetranitramine (HMX), and 2,4,6-trinitrotoluene (TNT). An EOD specialist will be present during sampling. The results of the field screening will be used to select locations for the collection of surface soil samples to be sent to a fixed-base lab for analysis.

Soil Boring

Split-spoon soil samples will be collected continuously from the ground surface to the water table for lithologic purposes. A maximum of three subsurface soil samples will be collected from each of four soil borings (a total of 12 samples) for chemical analysis at a fixed-base laboratory. Field screening for VOCs and explosives (see Section 5.5) will be performed to assist in the selection of samples for laboratory analysis. In the absence of significant field screening readings, soil samples will be collected at the surface, at a mid-depth point between the ground surface and the top of the water table, and at the soil interval just above the water table. The locations of the soil borings are described in the EnSafe VIWP. However, the locations maybe adjusted based on the field screening results.

Surface Water and Sediment Sampling

One surface water sample and one sediment sample will be collected from the effluent ditch. Two additional sediment samples will also be collected upstream from the surface water/sediment sampling location. One sediment sample will be collected from the IW32.

4.3 CHICAMUXEN CREEK'S EDGE DUMP SITE B SAMPLE LOCATIONS AND RATIONALE

An investigative matrix is provided in Table 4A-3 which summarizes the environmental media to be sampled, sampling rationale, investigative techniques, sampling locations, chemical analyses and

TABLE 4A-3

INVESTIGATIVE MATRIX
DUMP SITE B
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Media/Rationale	Investigative Techniques	Locations	Maximum Number of Samples	Analysis
GROUNDWATER - To determine if the shallow groundwater has been affected be site activities. And to charaterize the hydrogeology	Install 4 monitoring wells. Collect groundwater samples for chemical analysis and obtain water level measurements from the newly installed monitoring wells.	The locations for the newly installed monitoring wells are proposed to be one up gradient and three down gradient. The locations may be moved based on the magnetometer survey results or terrain.	4 groundwater samples.	Appendix IX metals, VOA, SVOA. Explosives.
SOILS - To determine the nature and vertical and horizontal extent of the contamination.	Surface soil field test kits performed on a100 ft spacing grid.	Collected at 0 to 2 feet depth at grid points.	Approximately 50 field test kit soil points.	Appendix IX metals, VOA, SVOA. Explosives.
	Well borings to the water table Obtain subsurface soil samples for chemical analysis and split spoon continuously for lithologic purposes.	Well borings located as stated above. Collect soil samples from two depths middle and lower portion of the boring above the water table.	14 subsurface soil samples: 8 samples from well borings and 6 samples from hand auger borings.	
	Hand auger soil borings.	Hand auger soil borings at six locations based on the field test kit results.	10 surface soil samples, 4 from the well boring locations and 6 from the hand auger soil boring locations.	
		Surface soil samples collected from the well boring locations.		
	Magnetometer survey.	Survey grid throughout the site.		

maximum number of samples to be collected at Chicamuxen Creek's Edge Dump Site B Sample Locations and Rationale. Figure 11A is provided to illustrate additional sampling locations.

Magnetometer Survey

A survey grid will be constructed with 50 foot spacings instead of 10 foot spacings, specified in the EnSafe VIWP. The grid will be located using global positioning satellite (GPS) techniques and tied into any permanent site features such as buildings or fence corners. The magnetometer survey results, if conclusive, will be used to locate the surface soil sample reference grid.

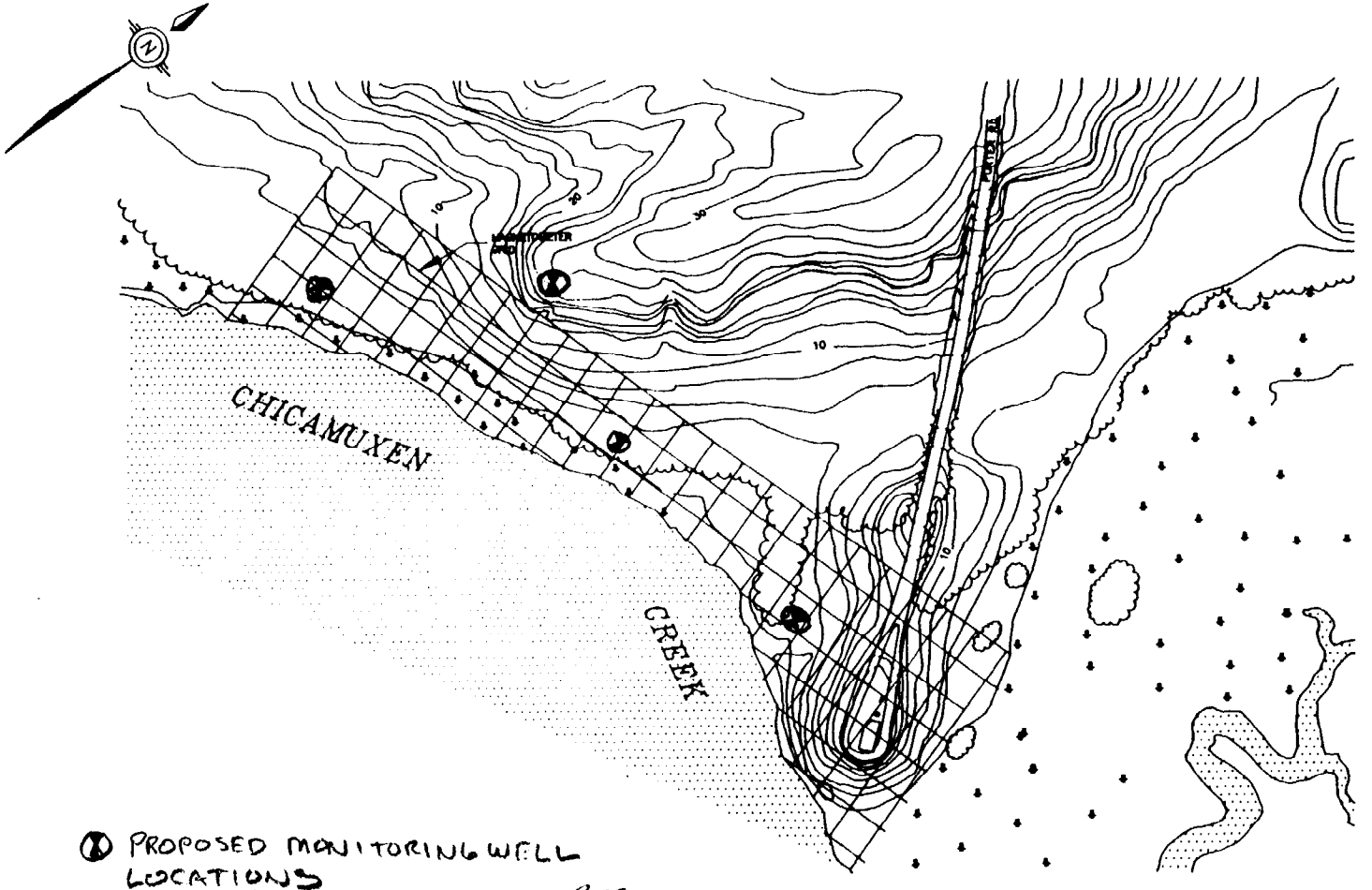
Surface Soil Sampling

Field screening test kits for explosives will be used to screen soil for the identification of potential hot spots and to better define the extent of contamination at the site, if any. A surface soil sample reference grid will be established. The grid will be staked at a constant interval of 100 feet, the total number of points will be 50 (5 point by 10 point grid). The grid dimensions may vary as actual field conditions may prohibit the collection of a surface soil sample. Soil samples will be collected from 0 to 2 feet at each sampling point and analyzed in the field with test kits for trimethylenetrinitramine (RDX), cyclotetramethylene tetranitramine (HMX), and 2,4,6-trinitrotoluene (TNT). An EOD specialist will be present during sampling.

A total of 10 surface soil samples will be collected for fixed base laboratory analysis. Six samples will be collected with a hand auger at locations identified as "hot spots" during the field screening or based on visual evidence of contamination. The remaining four surface soil samples will be collected at well boring locations.

Monitoring Well Installation/Soil boring

Monitoring well installation was not proposed by the EnSafe VIWP. However, 4 monitoring wells will be installed: one upgradient and three downgradient of the site. Figure 11A is provided to illustrate the proposed locations for the monitoring wells. Split spoon soil samples will be collected continuously from the ground surface to the water table for lithologic description. When the water table is encountered, split spoon samples will be collected at 5-foot intervals to 7 feet below the water table. A maximum of two subsurface soil samples will be collected from each of four monitoring well borings (a total of 8 samples) for chemical analyses at a fixed-base laboratory. Head space field screening for VOC (see Section 5.5) will be performed to assist in selection of samples for laboratory analysis. In the absence of significant field screening readings, soil samples will be collected at a mid-depth point between he ground surface and the top of the water table and at the soil interval just above the water table.



PROPOSED MONITORING WELL LOCATIONS

LEGEND

- PAVED ROAD
- UNPAVED ROAD
- 10' CONTOUR
- 2' CONTOUR
- WOODED AREA
- MARSH
- WATER
- MAGNETOMETER GRID

SOURCE: USN BUREAU OF YARDS AND DOCKS AREA PUBLIC WORKS OFFICE, CHESAPEAKE WASHINGTON, D.C. DWG. 1029300

250 0 250

SCALE FEET

VERIFICATION INVESTIGATION
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

FIGURE 11A
DUMP SITE B
MAGNETOMETER GRID

DATE: 09/13/95 | DWG NAME: 4DMSG

Water Level Measurement

One round of synoptic groundwater level measurements will be performed at all newly installed monitoring wells.

Groundwater Sampling

The four newly installed wells will be sampled as described in Section 5.10 of this document and Section 5.10 of the EnSafe VIWP.

4.4 AQUIFER TESTING

Slug tests will be performed at each newly installed monitoring well (total of 8) as part of the Verification Investigation.

4.6 HORIZONTAL AND VERTICAL SURVEY

All new groundwater wells, soil borings, and surface water/sediment sample locations will be surveyed. The top of the well riser pipe, the top of the protective casing, and the ground surface elevation at each well will be surveyed to within 0.01-foot vertical accuracy. In addition, all locations will be surveyed to a 0.1-foot horizontal accuracy. Existing survey monuments within Stump Neck Annex will be used as reference points. Horizontal locations will be tied into the State Plane coordinates. Vertical elevations will be referenced to 1929 North American Datum.

SECTION 5A

RFI SAMPLING PROCEDURES

5.0A SAMPLING PROCEDURES

The format of the EnSafe RFI Work Plan (RFIWP) has been adopted for this addendum to maintain consistency between the documents. Only those sections that need additions or revisions have been included in this Addendum.

5.1 SOIL GAS SURVEY

The survey grid will be generated by B&R Environmental personnel. The procedures provided in the EnSafe RFIWP will be followed. However the following changes will be implemented:

- Rinsate blanks will not be collected for this sampling effort.
- The Teflon® sample tubing will be sufficiently purged and reused between each sample location if there is no cross contamination observed.
- The heated head space analysis will not be performed; no groundwater will be collected during the soil gas survey.
- The sampling pipe will be driven to a maximum depth of three feet unless groundwater is encountered; the pipe will not be driven below the water table.
- A dedicated Tedlar bag will be used in lieu of the pre-evacuated glass vial to collect the soil gas sample. Soil gas samples will be analyzed at an on-site mobile laboratory and/or field screened with a PID.

5.2 SOIL SAMPLE COLLECTION PROCEDURES

Surface soil samples will be collected in the manner described in the EnSafe RFIWP. Samples for analytes except VOCs will be collected from the 0 to 1 foot bgs depth interval; samples collected from 0.5 to 1 foot bgs will be analyzed for VOCs.

5.3 HAND AUGER PROCEDURES

Hand auger procedures will be performed in the manner described in the EnSafe WP. However, the bore hole will be backfilled with dry bentonite chips then hydrated with approximately 1 gallon of potable water per linear foot.

5.4 MONITORING WELL INSTALLATION/SOIL BORING

The number of soil borings and monitoring wells listed in the EnSafe RFIWP has been changed as per Section 4.0 of this Addendum. In contrast to direction provided in the EnSafe WP, mud rotary drilling will not be considered as an acceptable methodology for this field effort.

5.5 SOIL BORING SAMPLING

At each soil boring location, split spoon samples will be screened with an photo-ionization detector by placing a small amount of soil into a plastic bag, inserting the PID probe into the bag, and recording the response on the boring log sheet. All split-spoon soil samples collected during the advancement of a soil boring will be evaluated in this manner.

5.6 MONITORING WELL INSTALLATION

Stainless steel centralizers will not be used due to the shallowness of the wells to be installed. The wells will be constructed of 2-inch PVC rather than the 4-inch PVC as described in the EnSafe WP. The drilling augers will act as a tremie pipe during the installation of the filter pack rather than using the 1 or 2-inch PVC pipe, as described in the EnSafe RFIWP.

5.7 WELL DEVELOPMENT

Wells will be developed, as described in the EnSafe WP, until parameter stabilization, as described in Section 5.8 of the EnSafe RFIWP.

5.8 WELL PURGING

The purge volume will be calculated using 0.163 as the constant converting linear feet of water in a 2-inch well.

5.10 GROUNDWATER SAMPLING

Wells will be sampled using stainless steel bailers, as described in the EnSafe RFIWP.

5.13 CHEMICAL ANALYSIS

Table 5-1 has been updated/revised as shown. Updates/revisions to analytical methods are discussed in the paragraphs which follow. The Estimated Quantitation Limit (EQL) on Tables 5-2 through 5-6 are derived from the associated analytical method.

Volatile and semivolatile analyses will be performed for the Appendix IX list of analytes. Both aqueous and solid analyses will be performed using the most recently promulgated SW-846 Methods 8240B (volatiles) and 8270B (semivolatiles). Methods 624 and 625 will not be used since these methods are intended for wastewater effluent samples, not groundwater samples. In addition, the use of SW-846 methods will provide consistency with the analytical methods used for CTO 222.

Explosives will be analyzed by SW-846 Method 8330 instead of USATHAMA 3S UW14 as suggested in the EnSafe RFIWP. Method 8330 was not yet promulgated at the time the EnSafe RFIWP was initially written. Additionally, while the USATHAMA method does not provide an extraction procedure for solid samples (as noted in Section 6.6.2), Method 8330 provides preparation and analysis procedures for both aqueous and solid samples. Analysis for explosives by Method 8330 will include several parameters in addition to TNT, RDX, and HMX. The list of parameters is provided in attached Table 5-5.

Total organic carbon (TOC) in solid samples will be analyzed by the Lloyd Kahn method, a method widely accepted for the analysis of TOC in solids.

The method for Total Organic Halogen (TOX) has been updated to reflect the recently promulgated version, Method 9020B.

TABLE 5-1

ANALYTICAL REQUIREMENTS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Constituents[1]	Method of Analysis
Appendix IX Metals	SW-846 Methods 6010A/7000 Series
Appendix IX Volatiles and Semivolatiles	SW-846 Methods 8240B and 8270B
Explosives	SW-846 Method 8330
Total Organic Carbon (TOC; water samples)	SW-846 Method 9060
Total Organic Carbon (TOC; solid samples)	Lloyd Kahn[2]
Total Organic Halogen (TOX)	SW-846 Method 9020B

1 Individual analytes are provided in Tables 5-2 through 5-6.

2 U.S. EPA, Region II, Environmental Services Division, Monitoring Management Branch. Lloyd Kahn, Determination of Total Organic Carbon in Sediment.

TABLE 5-2

ESTIMATED QUANTITATION LIMITS - APPENDIX IX METALS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Parameter	EQL(1)	
	Aqueous	Solid(2)
Appendix IX Metals	µg/L	mg/kg
Antimony	32	6.4
Arsenic	1	0.2
Barium	2	0.4
Beryllium	0.3	0.06
Cadmium	4	0.8
Chromium	7	1.4
Cobalt	7	1.4
Copper	6	1.2
Lead	1	0.2
Mercury	0.2	0.1
Nickel	15	3
Selenium	2	0.4
Silver	7	1.4
Thallium	1	0.2
Tin	10	2
Vanadium	8	1.6
Zinc	2	0.4

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher, based on the percent dry weight of each sample.

TABLE 5-3

ESTIMATED QUANTITATION LIMITS
APPENDIX IX VOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 1 OF 2

Appendix IX Volatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Acetone	100	100
Acetonitrile	100	100
Acrolein	100	100
Acrylonitrile	100	100
Allyl chloride	5	5
Benzene	5	5
Bromodichloromethane	5	5
Bromoform	5	5
Bromomethane	10	10
2-Butanone	100	100
Carbon disulfide	100	100
Carbon tetrachloride	5	5
Chlorobenzene	5	5
Chlorodibromomethane	5	5
Chloroethane	10	10
Chloroform	5	5
Chloromethane	10	10
Chloroprene	5	5
1,2-Dibromo-3-chloropropane	100	100
1,2-Dibromoethane	5	5
Dibromomethane	5	5
trans-1,4-Dichloro-2-butene	100	100
Dichlorodifluromethane	5	5
1,1-Dichloroethane	5	5
1,2-Dichloroethane	5	5
1,1-Dichloroethene	5	5
trans-1,2-Dichloroethene	5	5
1,2-Dichloropropane	5	5
cis-1,3-Dichloropropene	5	5
trans-1,3-Dichloropropene	5	5
1,4-Dioxane	100	100
Ethylbenzene	5	5
Ethyl methacrylate	5	5
2-Hexanone	50	50

TABLE 5-3

ESTIMATED QUANTITATION LIMITS
APPENDIX IX VOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 2 OF 2

Appendix IX Volatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Isobutyl alcohol	100	100
Methacrylonitrile	100	100
Methylene chloride	5	5
Methyl iodide	5	5
Methyl methacrylate	5	50
4-Methyl-2-pentanone	50	50
Pentachloroethane	10	10
Propionitrile	100	100
Styrene	5	5
1,1,1,2-Tetrachloroethane	5	5
1,1,2,2-Tetrachloroethane	5	5
Tetrachloroethene	5	5
Toluene	5	5
1,1,1-Trichloroethane	5	5
1,1,2-Trichloroethane	5	5
Trichloroethene	5	5
Trichlorofluoromethane	5	5
1,2,3-Trichloropropane	5	5
Vinyl acetate	50	50
Vinyl chloride	10	10
Xylene (Total)	5	5

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 1 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Acenaphthene	10	660
Acenaphthylene	10	660
Acetophenone	10	ND
2-Acetylaminofluorene	20	ND
4-Aminobiphenyl	20	ND
Aniline	ND	ND
Anthracene	10	660
Aramite	20	ND
Benz(a)anthracene	10	660
Benzo(b)fluoranthene	10	660
Benzo(k)fluoranthene	10	660
Benzo(g,h,i)perylene	10	660
Benzo(a)pyrene	10	660
Benzyl alcohol	20	1300
Bis(2-chloroethoxy)methane	10	660
Bis(2-chloroethyl)ether	10	660
Bis(2-chloroisopropyl)ether	10	660
4-Bromophenyl phenyl ether	10	660
Butyl benzyl phthalate	10	660
4-Chloroaniline	20	1300
Chlorobenzilate	10	ND
4-Chloro-3-methylphenol	20	1300
2-Chloronaphthalene	10	660
2-Chlorophenol	10	660
4-Chlorophenyl phenyl ether	10	660
Chrysene	10	660
Diallate	10	ND
Dibenz(a,h)anthracene	10	660
Dibenzofuran	10	660
Di-n-butyl phthalate	10	ND
1,2-Dichlorobenzene	10	660
1,3-Dichlorobenzene	10	660
1,4-Dichlorobenzene	10	660
3,3'-Dichlorobenzidine	20	1300

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 2 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
2,4-Dichlorophenol	10	660
2,6-Dichlorophenol	10	ND
Diethyl phthalate	10	660
Dimethoate	20	ND
Dimethylaminoazobenzene	10	ND
7,12-Dimethylbenz(a)anthracene	10	ND
3,3'-Dimethylbenzidine	10	ND
a,a-Dimethylphenethylamine	ND	ND
2,4-Dimethylphenol	10	660
Dimethyl phthalate	10	660
1,3-Dinitrobenzene	20	ND
4,6-Dinitro-2-methylphenol	50	3300
2,4-Dinitrophenol	50	3300
2,4-Dinitrotoluene	10	660
2,6-Dinitrotoluene	10	660
Diphenylamine	ND	ND
Di-n-octyl phthalate	10	660
Bis(2-ethylhexyl) phthalate	10	660
Ethyl methanesulfonate	20	ND
Fluoranthene	10	660
Fluorene	10	660
Hexachlorobenzene	10	660
Hexachlorobutadiene	10	660
Hexachlorocyclopentadiene	10	660
Hexachloroethane	10	660
Hexachlorophene	50	ND
Hexachloropropene	10	ND
Indeno(1,2,3-cd)pyrene	10	660
Isodrin	20	ND
Isophorone	10	660
Isosafrole	10	ND
Methapyrilene	100	ND
3-Methylcholanthrene	10	ND
Methyl methanesulfonate	10	ND

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 3 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
2-Methylnaphthalene	10	660
2-Methylphenol	10	660
3-Methylphenol	10	ND
4-Methylphenol	10	660
Naphthalene	10	660
1,4-Naphthoquinone	10	ND
1-Naphthylamine	10	ND
2-Naphthylamine	10	ND
2-Nitroaniline	50	3300
3-Nitroaniline	50	3300
4-Nitroaniline	20	ND
Nitrobenzene	10	660
2-Nitrophenol	10	660
4-Nitrophenol	50	3300
5-Nitro-o-toluidine	10	ND
4-Nitroquinoline-1-oxide	40	ND
N-Nitrosodibutylamine	10	ND
N-Nitrosodiethylamine	20	ND
N-Nitrosodimethylamine	ND	ND
N-Nitrosomethylethylamine	ND	ND
N-Nitrosodiphenylamine	10	660
N-Nitroso-di-n-propylamine	10	660
N-Nitrosomorpholine	ND	ND
N-Nitrosopiperidine	20	ND
N-Nitrosopyrrolidine	40	ND
Pentachlorobenzene	10	ND
Pentachloronitrobenzene	20	ND
Pentachlorophenol	50	3300
Phenacetin	20	ND
Phenanthrene	10	660
Phenol	10	660
1,4-Phenylenediamine	10	ND
2-Picoline	ND	ND
Pronamide	10	ND

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 4 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Pyrene	10	660
Pyridine	ND	ND
Safrole	10	ND
1,2,4,5-Tetrachlorobenzene	10	ND
2,3,4,6-Tetrachlorophenol	10	ND
Tetraethyldithiopyrophosphate	ND	ND
Thionazine	20	ND
o-Toluidine	10	ND
1,2,4-Trichlorobenzene	10	660
2,4,5-Trichlorophenol	10	660
2,4,6-Trichlorophenol	10	660
1,3,5-Trinitrobenzene	10	ND
O,O,O-Triethyl phosphorothioate	NT	ND

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.
ND = Not determined.
NT = Not tested.

TABLE 5-5

ESTIMATED QUANTITATION LIMITS - EXPLOSIVES
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Parameter	EQL[1]	
	Aqueous Samples (µg/L)	Solid Samples[2] (µg/kg)
HMX	0.85	70
RDX	0.85	50
1,3,5-TNB	0.42	40
1,3-DNB	0.42	40
Tetryl	0.85	160
NB	0.42	35
2,4,6-TNT	0.42	40
4-Am-2,6-DNT	0.42	40
2-Am-DNT	0.42	50
2,6-DNT	0.42	50
2,4-DNT	0.42	50
2-NT	0.85	80
4-NT	0.85	90
3-NT	0.85	80

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.

TABLE 5-6

ESTIMATED QUANTITATION LIMITS - TOC AND TOX
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Parameter	EQL(1)	
	Aqueous Samples (mg/L)	Solid Samples (mg/Kg)
Total Organic Carbon (TOC)	1	200
Total Organic Halogen (TOX)	0.05	1

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.

The bulleted list of parameters for soil and water samples collected from Chicamuxen Creek's Edge Dump Site A and the Range 3 Burn Point should read as follows:

- Appendix IX Metals
- Appendix IX VOCs and SVOCs
- Explosives
- TOC
- TOX
- pH

The bulleted list of parameters for soil and water samples collected from Range 6 should read as follows:

- Appendix IX Metals
- Appendix IX VOCs and SVOCs
- Explosives

5.15 AQUIFER CHARACTERISTICS

Slug tests will be performed, as described in the EnSafe WP.

5.16.4 Sampling Equipment Decontamination

The equipment decontamination procedure described in the EnSafe RFIWP will be used on all equipment listed except that the hollow stem augers and the drill rods will be decontaminated as described in Section 5.16.3. It is not practical to use a solvent rinse on such large equipment.

5.17 Investigation Derived Waste

Soil cuttings will be containerized in 55-gallon drums. Disposable equipment such as nylon rope and Tyvek coveralls will be placed in large garbage bags for proper disposal in on-site dumpsters.

SECTION 5B

VI SAMPLING PROCEDURES

5.0B SAMPLING PROCEDURES

The format of the EnSafe VI Work Plan (VIWP) has been adopted for this addendum to maintain consistency between the documents. Only those sections that need additions or revisions have been included in this Addendum.

5.1 MAGNETOMETER SURVEY

A Geometrics G858 Cesium vapor magnetometer/gradiometer with a G856 base station and GPS be utilized for the magnetometer survey. This equipment will meet all of the objectives as detailed in the EnSafe VIWP. The sensor can be held vertically for rough terrain and areas of heavy vegetation. Data will be recorded through the use of a digital data logger and by hand in the field notebook.

5.2 SOIL SAMPLE COLLECTION PROCEDURES

Surface soil samples will be collected in the manner described in the EnSafe VIWP. Samples for all analytes except VOCs will be collected from the 0 to 1 foot bgs depth interval; samples collected from 0.5 to 1 foot bgs will be analyzed for VOCs.

5.3 HAND AUGER PROCEDURES

Hand auger procedures will be performed in the manner described in the EnSafe VIWP. However, the bore hole will be backfilled with dry bentonite chips then hydrated with approximately 1 gallon of potable water per linear foot.

5.4 MONITORING WELL INSTALLATION/SOIL BORING

The number of soil borings and monitoring wells listed in the EnSafe VIWP has been changed as per Section 4.0 of this Addendum. Mud rotary drilling will not be considered as an acceptable methodology for this field effort, as stated in the EnSafe WP.

5.5 SOIL BORING SAMPLING

At each soil boring location, split spoon samples will be screened with an photo-ionization detector by placing a small amount of soil into a plastic bag, inserting the PID probe into the bag, and recording the response on the boring log sheet. All split-spoon soil samples collected during the advancement of a soil boring will be evaluated in this manner.

5.6 MONITORING WELL INSTALLATION

Stainless steel centralizers will not be used due to the shallowness of the wells to be installed. The wells will be constructed of 2-inch PVC rather than the 4-inch PVC as described in the EnSafe WP. The drilling augers will act as a tremie pipe during the installation of the filter pack rather than using the 1 or 2-inch PVC pipe, as described in the EnSafe VIWP.

5.7 WELL DEVELOPMENT

Wells will be developed, as described in the EnSafe WP, until parameter stabilization, as described in Section 5.8 of the EnSafe WP.

5.8 WELL PURGING

The purge volume will be calculated using 0.163 as the constant converting linear feet of water in a 2-inch well.

5.10 GROUNDWATER SAMPLING

Wells will be sampled using stainless steel bailers, as described in the EnSafe VIWP.

5.13 CHEMICAL ANALYSIS

Table 5-1 has been updated/revised as shown. Updates/revisions to analytical methods are discussed in the paragraphs which follow. The Estimated Quantitation Limit (EQL) on Tables 5-2 through 5-6 are derived from the associated analytical method.

Volatile and semivolatile analyses will be performed for the Appendix IX list of analytes. Both aqueous and solid analyses will be performed using the most recently promulgated SW-846 Methods 8240B (volatiles) and 8270B (semivolatiles). Methods 624 and 625 will not be used since these methods are intended for wastewater effluent samples, not groundwater samples. In addition, the use of SW-846 methods will provide consistency with the analytical methods used for CTO 222.

TABLE 5-1

ANALYTICAL REQUIREMENTS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Constituents[1]	Method of Analysis
Appendix IX Metals	SW-846 Methods 6010A/7000 Series
Appendix IX Volatiles and Semivolatiles	SW-846 Methods 8240B and 8270B
Explosives	SW-846 Method 8330
Total Organic Carbon (TOC; water samples)	SW-846 Method 9060
Total Organic Carbon (TOC; solid samples)	Lloyd Kahn[2]
Total Organic Halogen (TOX)	SW-846 Method 9020B

1 Individual analytes are provided in Tables 5-2 through 5-6.

2 U.S. EPA, Region II, Environmental Services Division, Monitoring Management Branch. Lloyd Kahn, Determination of Total Organic Carbon in Sediment.

TABLE 5-2

ESTIMATED QUANTITATION LIMITS - APPENDIX IX METALS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Parameter	EQL(1)	
	Aqueous	Solid(2)
Appendix IX Metals	µg/L	mg/kg
Antimony	32	6.4
Arsenic	1	0.2
Barium	2	0.4
Beryllium	0.3	0.06
Cadmium	4	0.8
Chromium	7	1.4
Cobalt	7	1.4
Copper	6	1.2
Lead	1	0.2
Mercury	0.2	0.1
Nickel	15	3
Selenium	2	0.4
Silver	7	1.4
Thallium	1	0.2
Tin	10	2
Vanadium	8	1.6
Zinc	2	0.4

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher, based on the percent dry weight of each sample.

TABLE 5-3

ESTIMATED QUANTITATION LIMITS
APPENDIX IX VOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 1 OF 2

Appendix IX Volatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Acetone	100	100
Acetonitrile	100	100
Acrolein	100	100
Acrylonitrile	100	100
Allyl chloride	5	5
Benzene	5	5
Bromodichloromethane	5	5
Bromoform	5	5
Bromomethane	10	10
2-Butanone	100	100
Carbon disulfide	100	100
Carbon tetrachloride	5	5
Chlorobenzene	5	5
Chlorodibromomethane	5	5
Chloroethane	10	10
Chloroform	5	5
Chloromethane	10	10
Chloroprene	5	5
1,2-Dibromo-3-chloropropane	100	100
1,2-Dibromoethane	5	5
Dibromomethane	5	5
trans-1,4-Dichloro-2-butene	100	100
Dichlorodifluromethane	5	5
1,1-Dichloroethane	5	5
1,2-Dichloroethane	5	5
1,1-Dichloroethene	5	5
trans-1,2-Dichloroethene	5	5
1,2-Dichloropropane	5	5
cis-1,3-Dichloropropene	5	5
trans-1,3-Dichloropropene	5	5
1,4-Dioxane	100	100
Ethylbenzene	5	5
Ethyl methacrylate	5	5
2-Hexanone	50	50

TABLE 5-3

ESTIMATED QUANTITATION LIMITS
APPENDIX IX VOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 2 OF 2

Appendix IX Volatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Isobutyl alcohol	100	100
Methacrylonitrile	100	100
Methylene chloride	5	5
Methyl iodide	5	5
Methyl methacrylate	5	50
4-Methyl-2-pentanone	50	50
Pentachloroethane	10	10
Propionitrile	100	100
Styrene	5	5
1,1,1,2-Tetrachloroethane	5	5
1,1,2,2-Tetrachloroethane	5	5
Tetrachloroethene	5	5
Toluene	5	5
1,1,1-Trichloroethane	5	5
1,1,2-Trichloroethane	5	5
Trichloroethene	5	5
Trichlorofluoromethane	5	5
1,2,3-Trichloropropane	5	5
Vinyl acetate	50	50
Vinyl chloride	10	10
Xylene (Total)	5	5

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 1 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Acenaphthene	10	660
Acenaphthylene	10	660
Acetophenone	10	ND
2-Acetylaminofluorene	20	ND
4-Aminobiphenyl	20	ND
Aniline	ND	ND
Anthracene	10	660
Aramite	20	ND
Benz(a)anthracene	10	660
Benzo(b)fluoranthene	10	660
Benzo(k)fluoranthene	10	660
Benzo(g,h,i)perylene	10	660
Benzo(a)pyrene	10	660
Benzyl alcohol	20	1300
Bis(2-chloroethoxy)methane	10	660
Bis(2-chloroethyl)ether	10	660
Bis(2-chloroisopropyl)ether	10	660
4-Bromophenyl phenyl ether	10	660
Butyl benzyl phthalate	10	660
4-Chloroaniline	20	1300
Chlorobenzilate	10	ND
4-Chloro-3-methylphenol	20	1300
2-Chloronaphthalene	10	660
2-Chlorophenol	10	660
4-Chlorophenyl phenyl ether	10	660
Chrysene	10	660
Diallate	10	ND
Dibenz(a,h)anthracene	10	660
Dibenzofuran	10	660
Di-n-butyl phthalate	10	ND
1,2-Dichlorobenzene	10	660
1,3-Dichlorobenzene	10	660
1,4-Dichlorobenzene	10	660
3,3'-Dichlorobenzidine	20	1300

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 2 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
2,4-Dichlorophenol	10	660
2,6-Dichlorophenol	10	ND
Diethyl phthalate	10	660
Dimethoate	20	ND
Dimethylaminoazobenzene	10	ND
7,12-Dimethylbenz(a)anthracene	10	ND
3,3'-Dimethylbenzidine	10	ND
a,a-Dimethylphenethylamine	ND	ND
2,4-Dimethylphenol	10	660
Dimethyl phthalate	10	660
1,3-Dinitrobenzene	20	ND
4,6-Dinitro-2-methylphenol	50	3300
2,4-Dinitrophenol	50	3300
2,4-Dinitrotoluene	10	660
2,6-Dinitrotoluene	10	660
Diphenylamine	ND	ND
Di-n-octyl phthalate	10	660
Bis(2-ethylhexyl) phthalate	10	660
Ethyl methanesulfonate	20	ND
Fluoranthene	10	660
Fluorene	10	660
Hexachlorobenzene	10	660
Hexachlorobutadiene	10	660
Hexachlorocyclopentadiene	10	660
Hexachloroethane	10	660
Hexachlorophene	50	ND
Hexachloropropene	10	ND
Indeno(1,2,3-cd)pyrene	10	660
Isodrin	20	ND
Isophorone	10	660
Isosafrole	10	ND
Methapyrilene	100	ND
3-Methylcholanthrene	10	ND
Methyl methanesulfonate	10	ND

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 3 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
2-Methylnaphthalene	10	660
2-Methylphenol	10	660
3-Methylphenol	10	ND
4-Methylphenol	10	660
Naphthalene	10	660
1,4-Naphthoquinone	10	ND
1-Naphthylamine	10	ND
2-Naphthylamine	10	ND
2-Nitroaniline	50	3300
3-Nitroaniline	50	3300
4-Nitroaniline	20	ND
Nitrobenzene	10	660
2-Nitrophenol	10	660
4-Nitrophenol	50	3300
5-Nitro-o-toluidine	10	ND
4-Nitroquinoline-1-oxide	40	ND
N-Nitrosodibutylamine	10	ND
N-Nitrosodiethylamine	20	ND
N-Nitrosodimethylamine	ND	ND
N-Nitrosomethylethylamine	ND	ND
N-Nitrosodiphenylamine	10	660
N-Nitroso-di-n-propylamine	10	660
N-Nitrosomorpholine	ND	ND
N-Nitrosopiperidine	20	ND
N-Nitrosopyrrolidine	40	ND
Pentachlorobenzene	10	ND
Pentachloronitrobenzene	20	ND
Pentachlorophenol	50	3300
Phenacetin	20	ND
Phenanthrene	10	660
Phenol	10	660
1,4-Phenylenediamine	10	ND
2-Picoline	ND	ND
Pronamide	10	ND

TABLE 5-4

ESTIMATED QUANTITATION LIMITS
APPENDIX IX SEMIVOLATILE ORGANICS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
PAGE 4 OF 4

Appendix IX Semivolatiles	EQL[1]	
	Aqueous (µg/L)	Solid[2] µg/kg
Pyrene	10	660
Pyridine	ND	ND
Safrole	10	ND
1,2,4,5-Tetrachlorobenzene	10	ND
2,3,4,6-Tetrachlorophenol	10	ND
Tetraethyldithiopyrophosphate	ND	ND
Thionazine	20	ND
o-Toluidine	10	ND
1,2,4-Trichlorobenzene	10	660
2,4,5-Trichlorophenol	10	660
2,4,6-Trichlorophenol	10	660
1,3,5-Trinitrobenzene	10	ND
O,O,O-Triethyl phosphorothioate	NT	ND

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.
ND = Not determined.
NT = Not tested.

TABLE 5-5

ESTIMATED QUANTITATION LIMITS - EXPLOSIVES
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Parameter	EQL[1]	
	Aqueous Samples (µg/L)	Solid Samples[2] (µg/kg)
HMX	0.85	70
RDX	0.85	50
1,3,5-TNB	0.42	40
1,3-DNB	0.42	40
Tetryl	0.85	160
NB	0.42	35
2,4,6-TNT	0.42	40
4-Am-2,6-DNT	0.42	40
2-Am-DNT	0.42	50
2,6-DNT	0.42	50
2,4-DNT	0.42	50
2-NT	0.85	80
4-NT	0.85	90
3-NT	0.85	80

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.

TABLE 5-6

ESTIMATED QUANTITATION LIMITS - TOC AND TOX
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Parameter	EQL[1]	
	Aqueous Samples (mg/L)	Solid Samples (mg/Kg)
Total Organic Carbon (TOC)	1	200
Total Organic Halogen (TOX)	0.05	1

1 EQL - Estimated Quantitation Limit. Limits may vary based on laboratory and sample matrix.
2 EQLs listed for soil/sediment are based on wet weight. Data will be reported on a dry weight basis; therefore, EQLs will be higher based on the percent dry weight of each sample.

Explosives will be analyzed by SW-846 Method 8330 instead of USATHAMA 3S UW14 as suggested in the EnSafe VIWP. Method 8330 was not yet promulgated at the time the VI Work Plan was initially written. Additionally, while the USATHAMA method does not provide an extraction procedure for solid samples (as noted in Section 6.6.2), Method 8330 provides preparation and analysis procedures for both aqueous and solid samples. Analysis for explosives by Method 8330 will include several parameters in addition to TNT, RDX, and HMX. The list of parameters is provided in attached Table 5-5.

Total organic carbon (TOC) in solid samples will be analyzed by the Lloyd Kahn method, a method widely accepted for the analysis of TOC in solids.

The method for Total Organic Halogen (TOX) has been updated to reflect the recently promulgated version, Method 9020B.

5.15 AQUIFER CHARACTERISTICS

Slug tests will be performed, as described in the EnSafe VIWP.

5.16.4 Sampling Equipment Decontamination

The equipment decontamination procedure described in the EnSafe VIWP will be used on all equipment listed except that the hollow stem augers and the drill rods will be decontaminated as described in Section 5.16.3. It is not practical to use a solvent rinse on such large equipment.

5.17 Investigation Derived Waste

Soil cuttings will be containerized in 55-gallon drums. Disposable equipment such as nylon rope and Tyvek coveralls will be placed in large garbage bags for proper disposal in onsite dumpsters.

6.0 QUALITY ASSURANCE PLAN

The two referenced NEESA documents are no longer current. The "Navy Installation Restoration Laboratory Quality Assurance Guide" (Interim Guidance Document, Naval Facilities Engineering Service Center, Port Hueneme, California, February 1996) will be used. References to the outdated NEESA documents will be updated accordingly throughout the Quality Assurance Plan.

Table 6-1

Table 6-1 has been updated/revised as shown based on the field instruments which will be used. Further notes regarding Table 6-1 are provided in the following paragraphs.

TABLE 6-1

FIELD MEASUREMENTS
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Measurements Parameter	Matrix	Repeatability	Resolution Standard/Expanded	Completeness
pH	Water	±0.05 pH	0.1 / 0.01 pH	100
Temperature	Water	±0.3 °C	1 / 0.1 °C	100
Specific Conductance	Water	±1%	0-1 mS/cm: 0.01 mS/cm 0-10 mS/cm: 0.1 mS/cm 10-100 mS/cm: 1 mS/cm	100
Turbidity	Water	±3%	10 / 1 NTU	100
Static Water Level	Water	Not applicable	±0.01 ft	100
Photoionization Detector	Air	1% of calibration (calibrated w/100 ppm isobutylene)	0.1 ppm	100
Well Survey Points	Horizontal	1:10,000	±0.1 ft	100
	Vertical	0.05 ft $\sqrt{\text{miles}}$	±0.01 ft	100

References for all measurements except well survey points are Brown & Root Environmental SOPs. Standard Land Surveying Methods will be employed by registered land surveyors for well survey points.

Precision and accuracy column headings have been replaced by repeatability and resolution since these descriptives are more appropriate for these field measurements.

6.2.2 and 6.2.3 Sampling and Analysis/Precision and Accuracy

Methods 625 (for semivolatile organics) and 6240 (i.e., 624, for volatile organics) will not be used. As shown in Tables 5-1 and 6-5, graphite furnace methods (i.e., 7000 series) may also be used for metals analysis in addition to ICP (Method 6010). EPA Method 8330 will be used in place of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) Method UW14. An explanation regarding method updates/revisions was previously provided in the paragraph regarding Section 5.13.

Tables 6-2 through 6-4 should be disregarded. The QA goals provided in Tables 6-2 through 6-4, which are based on Contract Laboratory Program (CLP) protocols, are not applicable for the methods to be used. SW-846 methods require the use of statistically-derived internal laboratory control limits. The laboratory selected will provide and use internally developed precision and accuracy criteria (these criteria will be provided at a later date under separate cover). Internal laboratory control limits for precision are typically three times the standard deviation of a series of relative percent differences (RPDs), while internal laboratory control limits for accuracy are typically set at the mean plus or minus three times the standard deviation of a series of percent recovery (%R) values.

6.2.5 Completeness

The current statement regarding completeness is inaccurate and should be disregarded. Completeness is a measure of the amount of usable, valid analytical data obtained compared to the amount expected to be obtained. Completeness is typically expressed as a percentage. The ideal objective for completeness is 100 percent (i.e., every sample planned to be collected is collected; every sample submitted for analysis yields valid data). However, samples can be rendered unusable during shipping or preparation (e.g., bottles broken or extracts accidentally destroyed), errors can be introduced during analysis (e.g., loss of instrument sensitivity, introduction of ambient laboratory contamination), or strong matrix effects can become apparent (e.g., extremely low matrix spike recovery). These instances result in data that do not meet QC criteria. Based on these considerations, 90 percent is considered an acceptable target for the data completeness objective. If critical sampling points are lost, resampling and/or reanalysis may be required.

6.2.6 Comparability

References to NEESA 20.2-047B and NEESA 20.2-031A should be updated to current Navy guidance. See narrative (page 6-1) regarding Section 6.0.

6.3 PROJECT ORGANIZATION AND RESPONSIBILITIES

Reference to NEESA 20.2-047B and NEESA 20.2-031A should be updated to current Navy guidance. See narrative (page 6-1) regarding Section 6.0.

6.3.1.3 State or Local Oversight

The Work Plan alludes to a CAR (Contamination Assessment Report). This nomenclature is not currently used on CLEAN projects, so reporting will be conducted as follows: Verification Investigation (VI) and RCRA Facility Investigation (RFI) reports will present the results of the environmental investigations performed at the SWMUs addressed in the VI/RFI Work Plans prepared in 1995. The reports will be submitted to EPA Region III and the State of Maryland as directed by the Navy.

6.3.2.2 Analytical Laboratory

Reference to NEESA 20.2-047B should be updated to current Navy guidance. See narrative (page 6-1) regarding Section 6.0.

6.3.3 Soil and Sediment Sample Analysis

Soil samples will be analyzed as previously described in the narrative regarding Section 5.13.

6.3.4 Soil Sample Documentation

Reference to NEESA 20.2-031A should be updated to read Section 4.5 (Field Documentation) of the "Navy Installation Restoration Laboratory Quality Assurance Guide".

6.3.5 Groundwater Sample Analysis

Laboratory analyses for groundwater samples were previously discussed in the narrative regarding Section 5.13. Field parameters for groundwater samples will be performed as specified in the current RFI Work Plan text.

6.3.6 Groundwater Sample Documentation

Reference to NEESA 20.2-031A should be updated to read Section 4.5 (Field Documentation) of the "Navy Installation Restoration Laboratory Quality Assurance Guide".

6.4 SAMPLE IDENTIFICATION, CONTAINERS, PRESERVATION, AND LABELING

Reference to sample container cleaning procedures is not necessary since the laboratory will provide pre-cleaned sample containers. As described in Section 3.4.4 (Supplies and Glassware) of the "Navy Installation Restoration Laboratory Quality Assurance Guide", the laboratory must maintain copies of the manufacturer's certificates of guarantee for all precleaned bottles used for Navy samples, and must maintain documentation which correlates individual lots of sample bottles with the receiving Navy sampling project.

The following page provides an update for Figure 12 (sample container label).

An update of Table 6-5 is provided on the following pages.

6.4.1 Sample Identification

The sample nomenclature system described in this section will not be used. The Brown & Root Environmental Standard Operating Procedure (SOP) for sample nomenclature, SOP CT-04, has been appended as Appendix B.

6.4.5 Chain-of-Custody

The reference for chain-of-custody procedures should be updated to read Section 4.7 (Sample Custody and Shipment) of the "Navy Installation Restoration Laboratory Quality Assurance Guide".

The following page provides an update for Figure 13 (chain-of-custody form).

6.5 CALIBRATION PROCEDURES AND FREQUENCY

The reference for calibration procedures should be updated to read Section 3.5.5 (Calibration) of the "Navy Installation Restoration Laboratory Quality Assurance Guide".

The acronym included in the second paragraph (SPOs) should read SOPs.

6.6.2 Laboratory Analyses

Laboratory analyses for groundwater and soil samples were previously discussed in the narrative regarding Section 5.13. Note that hexavalent chromium analysis will not be performed. In addition,

TABLE 6-5

SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
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Analytical Method	Sample Matrix	Container Size/ Material(1)	Sample Preservation	Holding Time
SW-846 Method 8270B (Semivolatiles)	Soil	8 oz. glass, wide-mouth jar w/Teflon-lined lid	4°C, store in dark	14 days to extraction, 40 days to analysis
SW-846 Method 8270B (Semivolatiles)	Water	2.5 Liter amber glass jar w/Teflon lined-lid	4°C, store in dark	7 days to extraction, 40 days to analysis
SW-846 Method 6010A or (7000B Series)(2)	Soil	8 oz. glass jar(3) w/Teflon-lined lid	4°C	up to 6 months until analysis
SW-846 Method 6010A or (7000B Series)(2)	Water	1 Liter HDPE Bottle(3)	4°C pH <2 with HNO_3	up to 6 months until analysis
SW-846 Method 7471A (Mercury)	Soil	8 oz. clear glass, wide-mouth jar w/Teflon-lined lid(3)	4°C	28 days to analysis
SW-846 Method 7470A (Mercury)	Water	1 Liter HDPE Bottle(3)	4°C, pH <2 with HNO_3	28 days to analysis
SW-846 Method 8240B (Volatiles)	Soil	4 oz. clear glass, wide-mouth jar w/Teflon-lined lid	4°C, zero to minimal headspace	14 days to analysis
SW-846 Method 8240B (Volatiles)	Water	2 x 40 ml vials w/Teflon-lined septa	4°C, HCl to pH <2, zero headspace	14 days to analysis
SW-846 Method 8330 (Explosives)	Soil	8 oz. clear glass, wide-mouth jar w/Teflon-lined lid	4°C, store in dark	14 days to extraction, 40 days to analysis
SW-846 Method 8330 (Explosives)	Water	1 Liter amber glass jar w/Teflon-lined lid	4°C, store in dark	7 days to extraction, 40 days to analysis
SW-846 Method 9020B (TOX)	Soil	4 oz. clear glass, wide-mouth jar w/Teflon-lined lid	4°C, store in dark	28 days to analysis
SW-846 Method 9020B (TOX)	Water	1 Liter amber glass jar w/Teflon-lined lid	4°C, dark, pH <2 with H_2SO_4	28 days to analysis
Lloyd Kahn (TOC)	Soil	4 oz. clear glass, wide-mouth jar w/Teflon-lined lid	4°C	14 days
SW-846 Method 9060 (TOC)	Water	250 ml HDPE	4°C, pH <2 with HCL	28 days
SW-846 Method 9045B (pH)	Soil	4 oz. clear glass, wide-mouth jar w/Teflon-lined lid	4°C	Immediately
EPA Method 150.1 (pH)	Water	250 ml HDPE	4°C	Immediately

TABLE 6-5

SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND
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1 Container volume may vary based on the laboratory.
2 In order to obtain an adequate Practical Quantitation Limit for each metal, graphite furnace atomic absorption methods may be required for the analysis of arsenic, lead, selenium, and thallium.
3 Samples for all metals analyses, including mercury, will be taken from the same container (per matrix).
HDPE = High-density polyethylene

SW-846 Method 8330 (explosives) does include an extraction method for soil/sediment samples; therefore, the modified Soxhlet method extraction procedure will not be necessary.

6.7 DATA REDUCTION, VALIDATION, AND REPORTING

Much of the content in this Section is no longer applicable based on current NFESC guidance. Therefore, the first paragraph in Section 6.7 should be replaced by the following paragraph:

Laboratory procedures for data review will be performed as specified in Section 3.8.12 (Data Review) of the "Navy Installation Restoration Laboratory Quality Assurance Guide". Data reported by the laboratory will be in accordance with CLP reporting format to the extent practicable. Data will be reported using CLP data flags. All solid sample results will be reported on a dry-weight basis. Results will also be adjusted, as necessary, for sample aliquot size and dilution factors. All pertinent quality control data including raw data, report narratives, sample preparation logs, and summary forms for blanks, standards analysis, calibrations, surrogates, internal standards, etc., must be provided. Internal QC checks and data validation procedures are described in Section 6.8.

6.8 FIELD AND LABORATORY CHECKS

The data validation checklists and the data classification system which are noted in this section were specific to the engineering subcontractor who initially prepared the work plan. These checklists and data classification system will not be used. Data validation for all laboratory analytical data will be performed by the Brown & Root Environmental Chemistry Department. Validation will be performed versus the analytical methods and, since the analytical methods are not based on Contract Laboratory Program protocol, to the greatest extent possible in accordance with the Region III Modifications to National Functional Guidelines for Organic Data Review, Multi-Media, Multi-Concentration (OLM01.0-OLM01.9, September 1994) and the Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (April 1993).

The references included in the second paragraph of Section 6.8 should be updated to read Section 3.5.6 (Quality Control Samples) of the "Navy Installation Restoration Laboratory Quality Assurance Guide". It should also be noted that the reference to Level C is no longer applicable based on current Navy guidance.

6.8.1 Field Data Quality

The text in the first paragraph of Section 6.8.1 currently states that a copy of all field records will be forwarded to the EIC of the project. Since this information would be of little benefit to the EIC during the course of the project, a copy of the field records will not automatically be provided. However, field records will be available for review by the EIC if requested. Additionally, select field records will be appended to the VI/RFI reports which summarize the results of the environmental investigations.

The last sentence in the paragraph regarding duplicates requires clarification. The sentence currently states that the field duplicate will be used for preparation of the laboratory matrix spike and matrix spike duplicate samples. The sentence should read that the field duplicate will be collected from the same location as the sample collected for matrix spike/matrix spike duplicate analysis.

The paragraph describing field blanks should be clarified to indicate that the organic-free water used to prepare the field blank is the source water for field equipment decontamination. In addition, the text, which currently states that one field blank per sampling event will be prepared, should state that one field blank will be prepared for each water source used for equipment decontamination.

The current text states that rinsate blanks will be collected with a frequency of once per week. This frequency is inadequate. Rinsate blanks will be collected once per day per sampling event for nondisposable equipment and will typically be analyzed every other day. Rinsate blanks for disposable equipment will be collected with a frequency of one blank per each lot of disposable equipment.

Table 6-6 Quality Control Sample Collection Frequencies

The frequency for the rinsate blank should read one per day per sampling event.

The frequency for the field blank should read one per decontamination water source.

The term "Duplicates" should be clarified to specify "Field Duplicates".

The text currently states that matrix spike/matrix spike duplicates (MS/MSDs) will only be collected for water samples. MS/MSD analysis will also be performed for solid samples. Extra sample volume for MS/MSD analysis is not required for soil samples or for aqueous samples for metals analysis.

6.8.2 Analytical Data Quality

The references in Section 6.8.2 should be updated to read the "Navy Installation Restoration Laboratory Quality Assurance Guide" instead of NEESA 20.2-047B. The current text also states that, for groundwater samples, a random sampling location will be chosen to collect samples for MS/MSD analysis for each set of 10 samples. This frequency is inconsistent with the frequency specified in Table 6-6. Both aqueous and solid samples will be designated for MS/MSD analysis at a frequency of one per twenty samples per matrix.

6.8.3 Field Data Package

The term "field data package" is inaccurate in that, while all field records and measurements obtained by sampling personnel will be maintained in the Brown & Root Environmental project files, an actual data package will not be prepared for field data. The Field Operations Leader (FOL) will review the field records on a daily basis for the bulleted items listed in Section 6.8.3. The checklist initially provided in Appendix A was specific to the engineering subcontractor who initially prepared the work plan. This checklist will not be used.

6.8.4 Analytical Data Package

The first paragraph in Section 6.8.4 is no longer accurate. Data validation for all laboratory analytical data will be performed by the Brown & Root Environmental Chemistry Department. Validation will be performed versus the analytical methods and, since the analytical methods are not based on Contract Laboratory Program protocol, to the greatest extent possible in accordance with the Region III Modifications to National Functional Guidelines for Organic Data Review, Multi-Media, Multi-Concentration (OLM01.0-OLM01.9, September 1994) and the Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (April 1993).

The last sentence in the last bullet is also inaccurate. Blank contaminants and associated data will be evaluated as specified in the Region III data validation guidelines specified in the previous paragraph.

6.8.5 Data Classification

The data classification system was specific to the engineering subcontractor who initially prepared the work plan. This system is not based on EPA guidance and is not considered to provide any added benefit to the data. Therefore, Section 6.8.5 should be disregarded.

6.9.1 Field System Audits

The references to Site Project Manager should be replaced by Field Operations Leader.

Formal systems audits are performed by Brown & Root Environmental for Navy projects on a program-wide basis by the corporate Quality Assurance Manager (QAM) or designee. A formal systems audit may be performed by the QAM during the course of the RFI. If a formal systems audit is conducted, the field audit report will be prepared for the audit as a whole, not for each sampling team member.

The reference to NEESA 20.2-031A should be updated to reference the "Navy Installation Restoration Laboratory Quality Assurance Guide".

6.9.2 Laboratory Systems Audit

The Systems Audit Checklist used by the EPA Contract Laboratory Program is not applicable to this project since non-CLP methods are being used.

The reference to NEESA guidance should be updated to Section 3.8.10 (Internal and External Audits) of the "Navy Installation Restoration Laboratory Quality Assurance Guide".

6.10 PREVENTIVE MAINTENANCE

Table 6-7 and the text following it in Section 6.10 should be disregarded. A Horiba Model U-10 Water Quality Checker will be used to measure pH, temperature, specific conductance and turbidity. A Photovac Model 2020 Photoionization Detector will also be used. In addition, a Solinst M-Scope will be used to measure static water levels.

Brown & Root Environmental has established a program for the maintenance of field equipment to ensure the availability of equipment in good working order when and where it is needed. This program consists of the following elements:

- The Brown & Root Environmental equipment manager keeps an inventory of the equipment in terms of items (model and serial number), quantity, and condition. Each item of equipment is signed out when in use, and its operating condition and cleanliness checked upon return.

- The equipment manager conducts routine checks on the status of equipment and is responsible for the stocking of spare parts and equipment readiness. The equipment manager also maintains the equipment manual library.

- The FOL is responsible for working with the equipment manager to make sure that the equipment is tested, cleaned, charged, and calibrated in accordance with the manufacturer's instructions and Brown & Root Environmental SOPs before assignment to the job site during field activities.

- During calibration, an appropriate maintenance check is performed on each piece of equipment. Any problems encountered while operating the instrument will be recorded in the field log book including a description of the symptoms and corrective actions taken.

- If problem equipment is detected or requires service, the equipment is logged, tagged, and segregated from equipment in proper working order. Use of the instrument is not resumed until the problem is resolved.

6.12 CORRECTIVE ACTION

The reference in the second paragraph of Section 6.12 should be updated to read Section 3.8.2 (Corrective Action) of the "Navy Installation Restoration Laboratory Quality Assurance Guide".

6.13.1 Quality Assurance Reports to Management/Internal Reports

The current text in Section 6.13.1 should be disregarded and replaced with the following:

Internal quality assurance reports to management will be provided in three primary formats during the course of the investigation. Data validation letter reports will be prepared by the Brown & Root Environmental Chemistry Department and provided to the Project Manager for each laboratory analytical data package. Data validation letter reports will summarize quality assurance issues for the subcontract laboratory data. These reports will address all major and minor laboratory noncompliances as well as noted sample matrix effects.

In addition, written weekly reports summarizing accomplishments, upcoming activities, and quality control/quality assurance issues during the field investigation will be provided to the Project Manager by the FOL.

Finally, monthly project reports are provided to the Navy by the Project Manager. These reports address the project budget, schedule, accomplishments, planned activities, and quality assurance/quality control issues.

6.13.2 Reports to NFESC

The current text in section 6.13.2 should be disregarded and replaced with the following:

The engineering subcontractor will provide a data QA summary within the draft VI and RFI reports. The QA summary will consist of cover letters from data validation memoranda. The draft VI and RFI reports will be submitted to the CHESDIV EIC in accordance with the schedule negotiated for CTO 287.

6.13.3 Reports to MDE

The current text in section 6.13.2 should be disregarded and replaced with the following:

Final VI and RFI reports will be submitted to the CHESDIV EIC following Navy review of the draft reports per the schedule negotiated for CTO 287.

7.0 HEALTH AND SAFETY PLAN

This section is replaced in its entirety in both the RFI and VI Work Plans prepared by EnSafe in 1995 by the Brown & Root Environmental Health and Safety Plan in Appendix A of this document.

8.0 POTENTIAL CORRECTIVE MEASURES

This section is acceptable as presented in the RFI and VI Work Plans prepared by EnSafe in 1995. Brown & Root Environmental proposes no changes or addenda for this section.

9.0 COMMUNITY RELATIONS PLAN

This section is acceptable as presented in the RFI and VI Work Plans prepared by EnSafe in 1995. Brown & Root Environmental proposes no changes or addenda for this section.

10.0 REFERENCES

This section is acceptable as presented in the RFI and VI Work Plans prepared by EnSafe in 1995. Brown & Root Environmental proposes no changes or addenda for this section.

APPENDIX B

SAMPLE NOMENCLATURE SOP

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1.0 PURPOSE

The purpose of this document is to specify a consistent sample nomenclature system that will facilitate subsequent data management in a cost-effective manner. The sample nomenclature system has been devised such that the following objectives can be attained:

- Sorting of data by matrix.
- Sorting of data by depth.
- Maintenance of consistency (field, laboratory, and data base sample numbers).
- Accommodation of all project-specific requirements on a global basis.
- Accommodation of laboratory sample number length constraints (10 characters).

2.0 SCOPE

The methods described in this procedure shall be used consistently for all projects requiring electronic data handling managed by personnel located in the Northeast Region of Brown & Root Environmental (Pittsburgh, Wayne, Holt, and Wilmington) and for any large contracts managed by the Northeast Region (e.g., NORTHDIV CLEAN, SOUTHDIV CLEAN, ARCS I, ARCS III, etc.). Smaller projects (as determined by Project Manager) are outside the scope of this SOP.

3.0 GLOSSARY

None.

4.0 RESPONSIBILITIES

Program Manager - It shall be the responsibility of the Program Manager (or designee) to inform contract-specific Project Managers of the existence and requirements of this Standard Operating Procedure.

Project Manager - It shall be the responsibility of the Project Manager to determine the applicability of this Standard Operating Procedure based on: (1) program-specific requirements, and (2) project size and objectives. It shall be the responsibility of the Project Manager (or designee) to ensure that the sample nomenclature is thoroughly specified in the relevant project planning document (e.g., sampling and analysis plan) and is consistent with this Standard Operating Procedure if relevant. It shall be the responsibility of the project manager to ensure that the Field Operations Leader is familiar with the sample nomenclature system.

Field Operations Leader - It shall be the responsibility of the Field Operations Leader to ensure that all field technicians or sampling personnel are thoroughly familiar with this Standard Operating Procedure and the project-specific sample nomenclature system. It shall be the responsibility of the Field Operations Leader to ensure that the sample nomenclature system is used during all project-specific sampling efforts.

5.0 PROCEDURES

5.1 Introduction

The sample numbering system consists of 12 distinct alpha-numeric characters, only 10 of which will be provided to the laboratory on the sample labels and chain-of-custody forms. The sample number provided to the lab shall be as follows where "A" indicates "alpha," "N" indicates "numeric," and "E" indicates "either"):

$$\overline{E}\ \overline{E}\ \overline{E}\ \overline{A}\ \overline{A}\ \overline{E}\ \overline{E}\ \overline{E}\ \overline{N}\ \overline{N}$$

Once the analytical results are received from the laboratory the sample number will be revised by a subroutine such that the sample number is more user friendly (i.e., dashes will be inserted). The sample number will then appear as follows:

$$\overline{E}\ \overline{E}\ \overline{E}\ -\ \overline{A}\ \overline{A}\ -\ \overline{E}\ \overline{E}\ \overline{E}\ -\ \overline{N}\ \overline{N}$$

If multiple sampling events occur (or are planned) for a given matrix, a subroutine within the database will be used to append two additional characters such that the sample number will appear as follows:

$$\overline{E}\ \overline{E}\ \overline{E}\ -\ \overline{A}\ \overline{A}\ -\ \overline{E}\ \overline{E}\ \overline{E}\ -\ \overline{N}\ \overline{N}\ -\ \overline{N}\ \overline{N}$$

Site Type Location Depth Round

5.2 Sample Number Field Requirements

The various fields in the sample number will include the following:

- Site Identifier
- Sample Type
- Sample Location
- Sample Depth Indicator
- Sampling Round

The site identifier must be a three-character field (numeric characters, alpha characters, or a mixture of alpha and numeric characters may be used). A site number is necessary since many facilities/sites have multiple individual sites, SWMUs, operable units, etc.

The sample type must be a two-character alpha field. Suggested codes are provided in Section 5.3 of this SOP.

The sample location must be a three-character field (alpha, numeric, or a mixture).

The depth field must be provided for all samples, regardless if it is strictly applicable (as discussed in Section 5.3).

The sampling round is optional, but, if provided, must be two numeric characters.

5.3 Example Sample Field Designations

Examples of each of the fields are as follows:

Site Number - Examples of site numbers/designations are as follows:

A01 - Area of Concern Number 1
125 - Solid Waste Management Unit Number 125
000 - Base or Facility Wide Sample (e.g., upgradient well)
BBG - Base Background

The examples cited are only suggestions. Each Project Manager (or designee) must designate appropriate (and consistent) site designations for their individual project.

Sample Type - Examples of sample types are as follows:

AS - Air Sample
BS - Biota Sample (See Note)
CP - Composite Sample
CS - Chip Sample
DS - Drum Sample
DU - Dust Sample
FP - Free Product
ID - Investigation Derived Waste Sample
LT - Leachate Sample
MW - Monitoring Well
OF - Outfall Sample
RW - Residential Well Sample
SB - Soil Boring Sample
SD - Sediment Sample
SC - Scrape Sample
SG - Soil Gas Sample
SP - Seep Sample
SS - Surface Soil Sample
SU - Subsurface Soil Sample
SW - Surface Water Sample
TP - Test Pit Sample
TW - Temporary Well Sample
WC - Well Construction Material Sample
WI - Wipe Sample
WP - Well Point Sample
WS - Waste/Sludge Sample

Note: The biota sample designation may be contingent upon the type of biota sampled (e.g., BL - Lobster; BF - Finfish; BC - Clam; BO - Oyster). Numerous other examples can be cited but will be site-specific.

This field will also be used to designate field Quality Control Samples, as follows:

TB - Trip Blank
FB - Field Blank
RB - Rinsate Blank (Equipment Blank)
BB - Bottle Blank
AB - Ambient Condition Blank

Field quality control samples should be numbered sequentially (e.g., RB-001; FB-010, etc.).

Filtered/unfiltered surface water or groundwater samples shall be handled in an separate manner, as subsequently discussed.

Location - Examples of the location field are as follows:

A01 - Grid node A1
001 - Monitoring Well 1

It is important that consistency be maintained with respect to the use of the characters "0" and O. Data base subroutines will not sort correctly if a mixture are used (e.g, AO1 and A02).

Depth - Formerly, depth specifications were indicated with a four digit field (e.g., 0002 - 0 to 2 feet). While this is effective for depth sorting, it is difficult to include this level of detail in a 10-character lab number (FormMaster limitations). In addition, this approach will not accommodate non-integer depths (e.g., 2.5 feet to 4.5 feet).

Based on such potential problems, the following approach shall be used: Sample depths will simply represent the horizon from which the sample was obtained: For example, if ten split-spoon samples are collected from a boring, they will be numbered 01 through 10. The sample log sheet will be used to record the specific depth of the sample, and this information will be entered in a separator field in the data base.

Similar nomenclature will be used for depth-specific surface water and sediment samples, etc. If no depth information is required (e.g., groundwater samples), the field must still be filled (e.g., Ø, Ø).

This field will also be used for the designation of filtered and unfiltered samples. An unfiltered groundwater sample shall be designated as U0, if and only if, a corresponding filtered sample is collected. Such as sample shall be designated as F0.

Sampling Round - The sampling round field is straightforward. It can range from 01 to 99.

5.4 Example Sample Numbers

Examples of complete sample numbers (field/data base versus laboratory) are as follows:

Field/Data Base ID	Lab ID	Description
101-SB-A01-01	101SBA0101	The first sample (e.g., 0 to 2 feet) from soil boring A01 (grid) at Site 101.
101-SB-A01-02	101SBA0102	The second sample from boring A01 (could be the next depth interval or a duplicate of 101-SB-A01-01).
125-MW-001-01-01	125MW00101	A groundwater sample from monitoring well MW001 (first sampling round)
125-MW-001-02-01	125MW00102	A duplicate groundwater sample from monitoring well MW001 (first sampling round)
130-MW-003-U1-01	130MW003U1	An unfiltered groundwater sample from monitoring well MW003 (first sampling round)
130-MW-003-F1-01	130MW003F1	A filtered groundwater sample from monitoring well MW003 (first sampling round)
137-RB-001-00-01	137RB00100	The first rinsate blank collected at site 137.
137-TB-004-00-02	137TB00400	The fourth trip blank collected during the second sampling event at Site 137.
155-SW-003-01-01	155SW00301	A surface water sample collected from the surface of a pond at Site 155.
155-SW-003-02-01	155SW00302	A surface water sample collected from the bottom of the water column in a pond at Site 155.

APPENDIX C

RESPONSE TO EPA COMMENTS

Brown & Root Environmental

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C-49-04-7-098

April 10, 1997

Project Number 7581

Mr. Robert Sadorra
Environmental Project Manager
Department of the Navy
Engineering Field Activity Chesapeake
Washington Navy Yard, Building 212
901 M Street SE
Washington, District of Columbia 20374-2121

Reference: Clean Contract No. N62472-90-D-1298
Contract Task Order No. 0287

Subject: Naval Explosive Ordnance Disposal
Technology Division, Stump Neck Annex
Indiana Head, Maryland
Final Comment Responses

Dear Mr. Sadorra:

Enclosed is one copy of the comment responses prepared for the RCRA Facility Investigation (RFI) and Verification Investigation (VI) Work Plans for Naval Explosive Ordnance Disposal Technology Division, Indian Head, Maryland, Stump Neck Annex. The responses provided address comments submitted by the United States Environmental Protection Agency, Region III, on the final RFI and VI Work Plans for Stump Neck Annex. These documents were prepared by Ensafe/Allen & Hoshall in the fall of 1995.

Please feel free to contact me at 412-921-8887 with any comments or questions regarding the information submitted.

Very truly yours,

Lee Ann Sinagoga

Lee Ann Sinagoga
Project Manager

LAS/vvp

Enclosures (2)

c: Mr. Roger Boucher, NORTHDIV (w/o enclosures)
Mr. John Trepanowski, BRE
Mr. Daryl Hutson, BRE
Project File 7581

RESPONSE TO ENVIRONMENTAL PROTECTION AGENCY (EPA) COMMENTS
RCRA FACILITY INVESTIGATION WORK PLAN (RFI)
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

COMMENT:

4.1 Chicamuxen edge Dump Site A/ Range 3 Burn Point, page 4-2, paragraphs 2 & 3

This section notes that samples taken below the saturated zone will be visually inspected for contamination. This section also states that if contamination is observed in surface sediments or surface water, these media will be sampled. Both of these procedures lack detail and rationale. While some of the contaminants of concern may result in staining or odors, others do not. Collection of samples based on visual observation may result in incorrect or incomplete assessment of the nature and extent of contamination. These procedures require further development.

RESPONSE:

Brown & Root Environmental will not rely solely on "visual inspection" of soils (including saturated soils) as an indicator of contamination. Brown & Root Environmental will follow its normal field sampling protocols. This includes field testing of any soils taken from a boring for VOCs using FID or PID meters. Soil samples may be further evaluated for the presence of VOCs using field head space sampling and analysis techniques (e.g., bagging and testing [i.e., VOC, PID, or FID readings] of suspect samples). Select soil boring samples will also be analyzed for explosives using field test kits. ALL field observations and field testing results will be carefully documented. These observations and results will be reviewed with the Navy in real-time to decide if saturated soil samples should be collected and sent to a fixed-base lab for analysis. Saturated soils are not automatically collected because human exposure to such soils is very unlikely and because data on the contaminant profile of the saturated soils is not always necessary for the evaluation of a potential groundwater contamination problem. Groundwater samples WILL BE COLLECTED from all monitoring wells installed. Brown & Root Environmental WILL COLLECT surface water and sediment samples for fixed-base laboratory analysis. Brown & Root Environmental is preparing a letter-report amendment to the Work Plan further addressing these issues.

COMMENT:

4.2 Range 6, page 4-4

Soil samples must be taken at 0-6" depth and thence at 5-foot intervals.

RESPONSE:

Surface soil samples (0 to 6 inch depth) and subsurface soil samples (at 5 foot intervals) will be taken at each of the monitoring wells installed at Range 6.

COMMENT:

5.1.3 Soil Gas Survey, page 5-1

Please clarify as to at what foot interval the internal grid will be established.

RESPONSE:

The soil gas survey grid will be as follows: Rum Point Landfill - 25 samples on 50' spacings, Dump Site A/Range 3 - 50 samples on 50' spacings, and Range 6 - 50 samples on 100' spacings.

COMMENT:

5.3 Hand Auger Procedures, page 5-6

Auger holes must be backfilled with clean soil or grout. The holes must not be filled with drill cuttings.

RESPONSE:

Hand auger holes will be filled with clean soil or grout.

COMMENT:

5.4 Soil Boring/Monitoring Wells, page 5-7

No mud rotary is to be used for drilling wells. The mud will alter the pore structure in the sediment around the well intake and reduce the permeability. Only drilling methods that do not inject drilling fluids into the formation are to be used.

RESPONSE:

No mud rotary drilling will be used for drilling wells or soil borings

COMMENT:

5.10 Ground Water Sampling, page 5-17

According to EPA's Region III protocols, samples to be analyzed for metals must be collected in 1-liter polyethylene bottles.

RESPONSE:

Ground water samples for metals will be collected in 1-liter polyethylene bottles per EPA Region III protocols.

COMMENT:

6.2.3 Precision and Accuracy, page 6-3

The information regarding precision and accuracy are specific to the analytical method capabilities. Additionally, precision and accuracy limits are quoted from the now defunct 2/88 Contract Laboratory Program Statement of Work. Accurately stated data quality objectives must reflect the data quality requirements needed to meet the overall project objectives.

RESPONSE:

Generally, samples will be analyzed per the most recently promulgated version of SW846 for the methods referenced in the QAPP. The laboratory selected for the project will provide and use internally developed precision and accuracy criteria as required as part of their participation in the Navy and EPA programs. The methods selected for the project (and the associated quality assurance protocol) were selected so that the environmental data collected will be suitable for use in human and ecological risk assessment. This issue will be further addressed in a letter-report amendment to the Work Plan.

COMMENT:

6.4 Sampling Identification, Containers, Preservation, and Labelling, page 6-9

Table 6-5 must include preservatives requirements for the water samples to be analyzed by EPA Method 624. The stated 14 days holding time is only valid for correctly preserved samples.

RESPONSE:

Properly preserved vials (HCl to pH<2 and cooling to 4°C) will be used for all samples submitted for volatile organic analysis.

COMMENT:

6.7 Data Reduction, Validation, and reporting, page 6-16

The Region III Modification to the EPA Laboratory Data Validation Guidelines for Evaluating Organic and Inorganic Analyses should be used where applicable. This document can be obtained from EPA's QA/QC Branch upon request.

RESPONSE:

The most recently promulgated EPA Region III Modification to the EPA Laboratory Data Validation Guidelines for Evaluating Organic and Inorganic Analyses will be used in all cases.

COMMENT:

6.8.1 Field Data Quality, page 6-19

Table 6-6 states that the rinsate blank will be collected at the rate of one per week for the duration of the field investigation. The purpose of the rinsate blank is to determine cross contamination which may occur as a result of inadequate decontamination procedures between sampling points/events. The collection and analyses of one per week is not adequately representative of sampling conditions. Additionally, during data validation, this information is one of the parameters used to assess the accuracy of reported sample results. Where non-dedicated equipment is used, rinsate must be collected every day.

RESPONSE:

Rinsate blanks will be collected each day of the environmental sampling event. On average, samples collected every other day will be sent to a fixed-base lab for analysis.

RESPONSE TO ENVIRONMENTAL PROTECTION AGENCY (EPA) COMMENTS
VERIFICATION INVESTIGATION (VI) WORK PLAN
STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

COMMENT:

5.4 Mud Rotary Drilling, page 5-6

Mud rotary is not an appropriate drilling method for this type of investigation. The use of mud will alter the pore structure in the sediment around the well intake and reduce the permeability. Only drilling methods that do not inject drilling fluids into the formation are to be used.

RESPONSE:

No mud rotary drilling will be used for drilling wells or soil borings

COMMENT:

5.7 Well Development, page 5-12

Specific conductivity, temperature, and pH must be recorded during development. Development must continue until these parameters have stabilized and the water turbidity is minimal.

RESPONSE:

Specific conductivity, temperature, and pH will be recorded during well development. Development will continue until these parameters have stabilized or until a maximum of five well volumes have been bailed/purged from the well.

COMMENT:

5.8 Well Purging, page 5-14

Ibid.

RESPONSE:

Specific conductivity, temperature, and pH will be recorded during well development. Development will continue until these parameters have stabilized or until a maximum of five well volumes have been bailed/purged from the well.

COMMENT:

5.10 Ground Water Sampling, page 5-16

According to EPA Region III protocols, samples to be analyzed for metals must be collected in 1-liter polyethylene bottle.

RESPONSE:

Ground water samples for metals will be collected in 1-liter polyethylene bottles per EPA Region III protocols.

SECTION 6 QUALITY ASSURANCE PLAN

COMMENT:

6.2.3 Precision and Accuracy, page 6-3

The precision and accuracy information is specific to the analytical methods capabilities. The precision and accuracy limits are quoted from the now defunct 2/88 Contract Laboratory Program Statement of Work. Accurately stated data quality objectives must reflect the data quality requirements needed to meet the overall project objectives.

RESPONSE:

Generally, samples will be analyzed per the most recently promulgated version of SW846 for the methods referenced in the QAPP. The laboratory selected for the project will provide and use internally developed precision and accuracy criteria. The analytical data produced by the laboratory will be validated by Brown & Root Environmental validation protocol using these precision and accuracy criteria. The methods selected for the project (and the associated quality assurance protocol) were selected so that the environmental data collected will be suitable for use in human and ecological risk assessment.

COMMENT:

6.4 Sample Identification, Containers, Preservation, and Labelling, page 6-11

Table 6-5 must include preservative requirements for the water samples to be analyzed by EPA Method 624. The stated 14 day holding time is only valid for correctly preserved samples.

RESPONSE:

Properly preserved vials (HCl to pH<2 and cooling to 4°C) will be used when sampling for volatile organic compounds.

COMMENT:

6.7 Data Reduction, Validation, and Reporting, page 6-16

The Region III modification to the EPA Laboratory Data Validation Guidelines for Evaluating Organic and Inorganic Analyses should be used where applicable. This document can be obtained from EPA's QA/QC Branch, upon request.

RESPONSE:

The most recently promulgated EPA Region III Modification to the EPA Laboratory Data Validation Guidelines for Evaluating Organic and Inorganic Analyses will be used in all cases.

COMMENT:

6.8.1 Field Data Quality, page 6-19

Table 6-6 states that the rinsate blank will be collected at the rate of one per week for the duration of the field investigation. The purpose of the rinsate blank is to determine cross contamination which may occur as a result of inadequate decontamination procedures

between sampling points/events. The collection and analysis of one per week is not adequately representative of sampling conditions. Additionally, during data validation, this information is one of the parameters used to assess the accuracy of reported sample results. Where non-dedicated equipment is used, rinsate must be collected every day.

RESPONSE:

Rinsate blanks will be collected each pay of the sampling event. On average, samples collected every other day will be sent to a fixed-base lab for analysis.

APPENDIX D

PROJECT SCHEDULE

PROJECT SCHEDULE

The project schedule is detailed in the attached chart.

DELIVERABLE	PROPOSED DATE
Planning	
Notice to Proceed	May 1, 1997
Site Visit/Prebid with Drillers	May 12 - May 16, 1997
Subcontractor Procurement	May 1 - June 6, 1997
Field Investigation/Lab Analysis	
Field Mobilization	June 167 - June 20, 1997
Soil and Groundwater sampling	June 23 - August 1, 1997
Schedule Reserve	August 4 - August 15, 1997
Lab Analysis	June 27 - September 15, 1997
Report Preparation	
Data Validation	August 15 - October 15, 1997
Database/Statistics	October 16 - November 14, 1997
Prepare Draft Report	November 17 - January 15, 1998
Submit Draft Report to Navy	January 16, 1998
Navy Review of Report	January 19, 1998 - February 16, 1998
Prepare Draft Final	February 17 - March 13, 1998
Submit Draft Final	March 13, 1998
Regulatory Review of Documents	March 17 - June 8, 1998
Meet With Regulators	April 14 - April 20, 1998
Prepare Final Document	April 24 - May 18, 1998
Submit Final Document	May 18, 1998