

Final

Workplan and Sampling and Analysis Plan
for the
Site Screening Assessment (SSA)

St. Juliens Creek Annex
Chesapeake, Virginia



Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command
Norfolk, Virginia

LANTDIV CLEAN II Program
Contract No. N62470-95-D-6007
Contract Task Order 00141

January 2001

Prepared by

CDM Federal Programs Corporation

Submitted by

CH2MHILL

01.09-01/01/01-00161

Final
Work Plan
and
Sampling and Analysis Plan
for the
Site Screening Assessment (SSA)

St. Juliens Creek Annex
Chesapeake, Virginia

Contract Task Order 00141

January, 2001

Prepared for
Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Under the
LANTDIV CLEAN II Program
Contract N62470-95-D-6007

Prepared by
CDM Federal Programs Corporation
Fairfax, Virginia

Submitted by

CH2M HILL

Herndon, Virginia

Table of Contents

Section	Page
Acronyms	iii
Section 1 Introduction	1-1
Section 2 Site Background and Physical Setting.....	2-1
Site Physical Setting and History.....	2-1
Site Identification and Regulatory Background	2-1
Section 3 Initial Evaluation	3-1
Site Background Information	3-1
IRP Sites.....	3-1
EPIC-AOCs	3-10
Section 4 Technical Approach and Work Plan Rationale.....	4-1
Task 1: Project Planning	4-1
Project Management	4-1
Meetings	4-1
Work Plan.....	4-1
Task 2: Field Investigation	4-3
Geophysical Surveying	4-3
Soil Sampling	4-4
Surface Water and Sediment Sampling	4-11
Surveying	4-13
Task 3: Sample Analysis and Data Validation.....	4-13
Sample Analysis	4-13
Data Validation	4-13
Task 4: Site Screening Assessment/Closeout Reports.....	4-16
Section 5 Staff Organization	5-1
Project Management	5-1
Project-Specific Organization.....	5-1
Section 6 Contractual Services	6-1
Section 7 Project Schedule	7-1

Tables

2-1 Investigation Status of IR and EPIC AOC Sites	2-3
4-1 Summary of Environmental Soil Samples	4-4
4-2 Summary of Sediment and Surface Water Samples.....	4-11
4-3 Summary of Soil and Sediment Samples to be Submitted for Analysis	
Site Screening Assessment	4-14
4-4 Summary of Aqueous Samples to be Submitted for Analysis	
St. Juliens Creek Annex – Site Screening Assessment	4-15

Table of Contents (con't)

Figures

2-1	Site Location Map, St. Juliens Creek Annex	2-2
3-1	Site 1 – Landfill A	3-2
3-2	Site 7 – Old Storage Yard.....	3-4
3-3	Site 8 – Cross and Mine Site.....	3-5
3-4	Site 10 – Hazardous Waste Disposal at Rail Road	3-6
	Site 11 – Hazardous Waste Disposal at Building, Site 18 –Building 47, Site 21 – Building 187 Soil Staining	3-8
3-6	Site 19 – Wharf Area Building M-5, Site 20 – Wharf Area Sediments	3-9
3-7	EPIC AOC 1.....	3-11
3-8	EPIC AOC 8.....	3-13
3-9	EPIC AOC 12.....	3-15
4-1	Proposed Surface Geophysics Area, Epic AOC 1	4-5
4-2	Proposed Surface Geophysics Area, EPIC AOC 8	4-6
4-3	Proposed Surface Geophysics Area, EPIC AOC 12.....	4-7
4-4	Proposed Surface/Subsurface Soil Sample Locations, EPIC AOC 1	4-8
4-5	Proposed Surface/Subsurface Soil Sample Locations, EPIC AOC 8	4-9
4-6	Proposed Surface/Subsurface Soil Sample Locations, EPIC AOC 12	4-10
4-7	Proposed Surface Water/Sediment Sample Locations, Site 1 – Landfill A	4-12
5-1	Project Organization	5-2
7-1	Project Schedule.....	7-2

Attachment A - Site Specific Plan Checklists

Attachment B – Health and Safety Emergency Contacts and Hospital Route

Acronyms

ASTN	American Society of Testing Materials
AOC	Area Of Concern
bgs	below ground surface
BLRA	Human Health Risk Assessment/Ecological Risk Assessment
BOA	Basic Ordering Agreements
BOD	Biological Oxygen Demand
BTAG	Biological Technical Assistance Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COPC	Chemical of Potential Concern
DDD	Dichlorodiphenyldichloroethene
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
Eh	Oxidation-Reduction Potential
EM	Electromagnetic
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
FSP	Field Sampling Plan
FY	Fiscal Year
GPS	Global Positioning System
HASP	Health and Safety Plan
HRS	Hazard Ranking Scoring
IAS	Initial Assessment Study
IDWMP	Investigation Derived Waste Master Plan
IRP	Installation Restoration Program
LANTDIV	U.S. Naval Facilities Engineering Command, Atlantic Division
LCPAH	Low Concentrations Polynuclear Aromatic Hydrocarbon
LQAP	Laboratory Quality Assurance Plan
mg/kg	Milligrams Per Kilogram
mg/L	Milligrams Per Liter
MS/MSD	Matrix Spike/Matrix Spike Duplicate

Acronyms (cont.)

NFA	No Further Action
NTR	Navy Technical Representative
PAHs	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated BiPhenyls
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RBC	Risk Based Concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RRR	Relative Risk Ranking
SAP	Sampling and Analysis Plan
SI	Site Investigation
SJCA	St. Juliens Creek Annex
SOP	Standard Operating Procedures
SSA	Site Screening Assessment
SVOCs	Semivolatile Organic Compounds
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TOC	Total Organic Carbon
ug/kg	Micrograms Per Kilogram
ug/L	Micrograms Per Liter
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VEPCO	Virginia Electric Power Company
VOC	Volatile Organic Compounds
WP	Work Plan

Section 1

Introduction

This work plan describes the work necessary to conduct a Site Screening Assessment (SSA) for 21 sites at the St. Juliens Creek Annex, Chesapeake, Virginia, and is based on a scope of work provided by Naval Facilities Engineering Command (NFEC) U.S. Naval Facilities Engineering Command, Atlantic Division (LANTDIV) on September 29, 1999 as part of Navy Contract N62470-95-D-6007 Comprehensive Long-Term Environmental Action Navy (C.L.E.A.N.), District III, Contract Task Order - 141. The technical approach is documented in CH2M HILL's implementation plan (IP).

The objective of this project is to collect, evaluate, and document sufficient data and or information for 21 sites at St. Juliens Creek Annex to determine for each site if: 1) additional investigation is necessary; or 2), a removal action is required; or 3) no further action is required. To accomplish this objective, CDM Federal Programs Corporation (CDM Federal) will: (1) collect and analyze surface and subsurface soil at three newly identified sites; (2) conduct geophysical surveys at the same three sites; (3) collect and analyze surface water and sediment sample in Blows Creek in the vicinity of one previously identified site; (4) prepare a Site Screening Assessment for 21 sites; and (5) prepare Close-Out reports for all sites categorized as NFA.

This streamlined Work plan is based on the Final Master Project Plans (dated July 2000) as agreed upon by the Virginia Department of Environmental Quality (VDEQ) and the U. S. Environmental Protection Agency (EPA) during the work-in-progress meeting/site visit of February 25, 2000. The general background and physical setting of the St. Juliens Creek Annex facility is described in Section 2 of this work plan. Section 3 presents an initial evaluation of the SSA sites based on the results of previous investigations and an initial site visit. Section 4 describes the technical approach and rationale for the SSA work plan tasks, and Section 5 presents general information on project management and staff organization. Section 6 documents the anticipated subcontract services required for completing tasks documented in this work plan. Section 7 presents the schedule for the completion of the tasks.

Section 2

Site Background and Physical Setting

Available site background information is documented in this section. Information was obtained primarily from the St. Juliens Creek Annex Facility, Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) report prepared by A.T. Kearney, Inc., 1989, the Relative Risk Ranking (RRR) System Data Collection Report prepared by CH2M Hill Federal Group, Ltd., 1996, and a joint US Environmental Protection Agency (EPA), Virginia Department of Environmental Quality (VDEQ), and Navy examination of EPA's Environmental Photographic Interpretation Center (EPIC) document (EPIC, 1995).

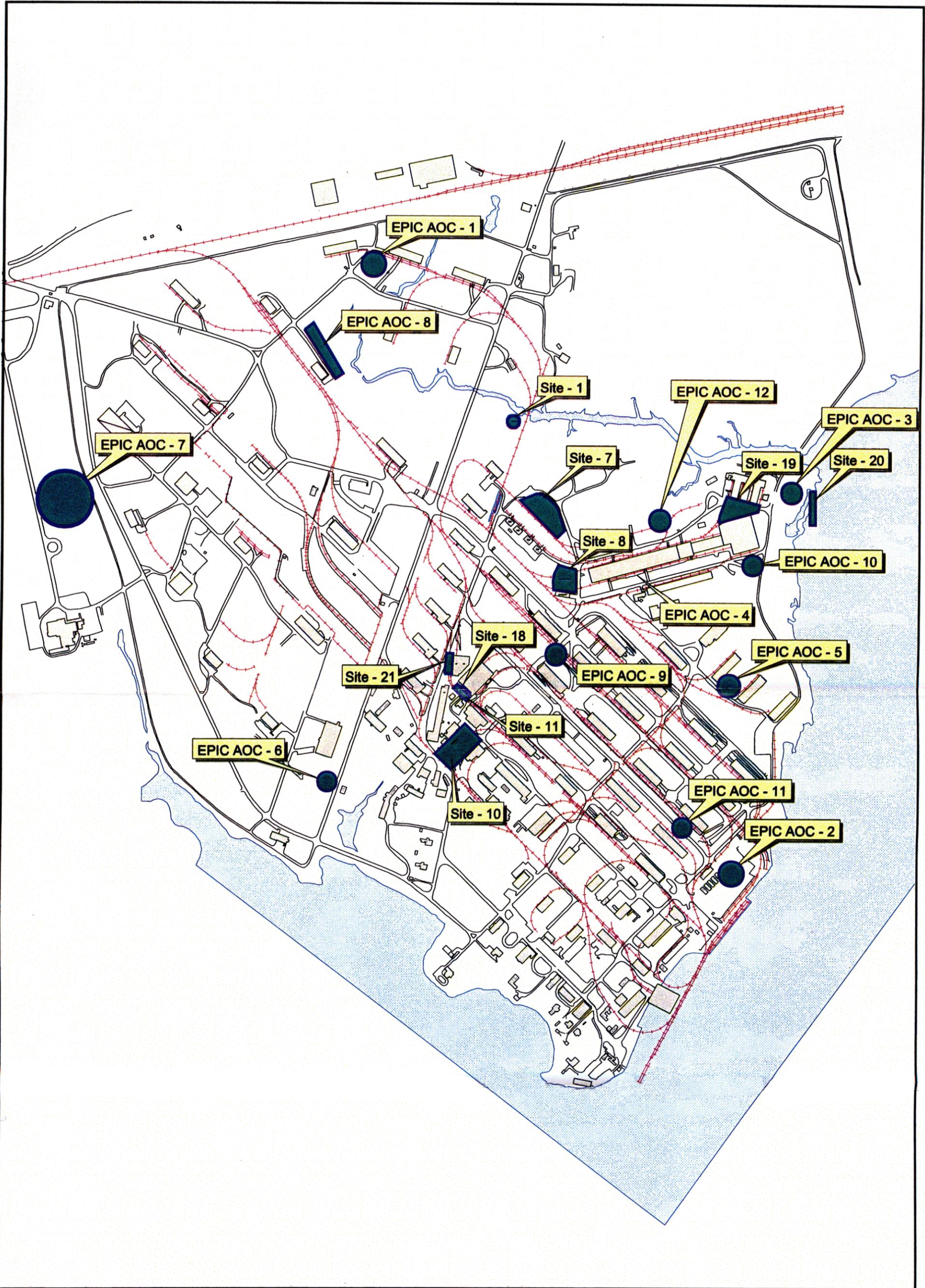
Site Physical Setting and History

The location of St. Juliens Creek Annex and the sites that will be screened as part of this project are shown in Figure 2-1. The physical setting of the annex, including the surrounding land use, climate, topography, and geology and hydrogeology and the operational and regulatory history of the facility, are described in the Final Master Project Plan, Naval Station Norfolk, St. Juliens Creek Annex (SJCA), Chesapeake, Virginia (CDM Federal 1999).

Site Identification and Regulatory Background

Several basewide environmental assessments have been conducted at St. Juliens Creek Annex to identify sites for investigation and remediation. These investigations include the Navy's Initial Assessment Study (IAS) and the EPA's RCRA Facility Assessment (RFA). The RFA identified a total of 46 potential sites [solid waste management units (SWMUs)/areas of concern (AOCs)]. Of these 46 areas, the RFA recommended some kind of additional investigation at 35 of these sites. Due to relative proximity to each other, several of these potential sites/AOCs were combined into 20 sites for additional investigation. The Navy later identified another site bringing the total number of SJCA sites to 21. During the construction of the Shore Intermediate Maintenance Activity facility in the early 1990s, 4 sites (Sites 9, 12, 13, and 14) were removed/remediated. In 1996, the Navy conducted a relative risk ranking (RRR) investigation that included sampling at the remaining 17 SJCA sites. The goal of the sampling effort was to gather data to assess and prioritize the cleanup of the facility's sites. Therefore, all 21 SJCA sites are considered "Installation Restoration Program (IRP) sites" even though the RFA did not recommend a full RCRA Facility Investigation at the majority of the sites.

In the SSA, the Relative Risk Ranking (RRR) analytical data from all 17 IR sites that have been sampled and that are not being investigated under an RI/FS will be screened against regulatory criteria. Site-specific recommendations will be made for IR sites 1, 7, 8, 10, 11, 18, 19, 20, and 21. The sites where an RI/FS is already underway (Sites 2, 3, 4, 5, and 6), the site proposed for a Site Investigation (SI)(Site 17) in FY 2001, those sites assigned to another



- LEGEND**
- Buildings
 - Roads
 - Hydrography Surface
 - Railroad

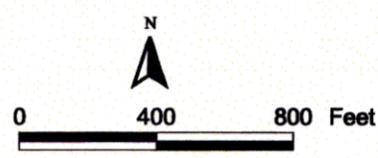


Figure 2-1

Site Location Map
 Site Screening Assessment
 St. Juliens Creek Annex

regulatory program (Sites 15 and 16) and those sites already remediated/removed (Sites 9, 12, 13, and 14) will not be addressed in the SSA.

Twelve potential AOCs were identified for investigation during the joint EPA, VDEQ, and Navy review of historical aerial photography (EPIC Study) of the facility in June 1999. In addition, during this meeting the EPA, VDEQ, and the Navy reviewed the status of each Solid Waste Management Unit (SWMU) and AOC identified during the RFA to determine if any of these sites, in addition to the 21 previously identified IRP sites, required additional investigation. During this meeting, RFA SWMU 22 was identified for limited sampling (1 or 2 samples). In November 1999, a work-in-progress/site visit with representatives of the Navy, CDM Federal, VDEQ, and the EPA-BTAG was conducted to evaluate the twelve "EPIC AOC" locations and review their current and past conditions (based on EPIC photographs) to determine if sampling was warranted at any of these EPIC AOCs. In addition, the group reviewed site conditions and the historical photography of the IRP sites to be included in the SSA investigation, and the site planned for a SI. All EPIC AOCs will be addressed in the SSA report; however, it was determined during this November 1999 meeting and site visit that sampling was warranted only at 3 of the 12 AOCs. The Navy, EPA, and VDEQ conducted an additional site visit on February 2, 2000 to confirm this determination. During the scoping of the SSA Investigation, the Navy and CDM Federal reviewed the information contained in the RFA report and historical photographs, and conducted a site visit of SWMU 22. The exact location of the SWMU could not be identified from the background information or field observations. Therefore, the Navy will follow the recommendation in the RFA and no further action will be taken at SWMU 22.

A summary of the status of the 21 IRP sites and 12 EPIC AOCs is shown on Table 2-1.

Table 2-1
Investigation Status of IR and EPIC AOC Sites

Site Name and Number	Investigation	Status/Comment
Site 1 - Landfill A	SSA	Planned
Site 2 - Landfill B	RI/FS/BLRA	In Progress
Site 3 - Landfill C	RI/FS/BLRA	In Progress
Site 4 - Landfill D	RI/FS/BLRA	In Progress
Site 5 - Burning Grounds	RI/FS/BLRA	In Progress
Site 6 - Small Items Pit (in study area of Site 5)	RI/FS/BLRA	In Progress
Site 7 - Old Storage Yard #1	SSA	Planned
Site 8 - Cross and Mine	SSA	Planned
Site 9 - Pest. Control Bldg. 249	None	NFA - remediated/removed
Site 10 - Waste Disposal at RR Tracks	SSA	Planned
Site 11 - Waste Disposal at Building 53	SSA	Planned
Site 12 - Sand Blast Area Bldg. 323	None	NFA - remediated/removed
Site 13 - Waste Generation Area	None	NFA - remediated/removed
Site 14 - Washrack Bldg. 266	None	NFA - remediated/removed
Site 15 - Fire Training Area	None	Assigned to a more appropriate regulatory program

Table 2-1
Investigation Status of IR and EPIC AOC Sites (cont'd)

Site Name and Number	Investigation	Status/Comment
Site 16 – DRMO Storage/Salvage Yard	None	Assigned to a more appropriate regulatory program
Site 17 – Storage Pad at Building 279	SI	Planned
Site 18 – Blasting Grit at Building 47	SSA	Planned
Site 19 – Wharf Area, Building M-5	SSA	Planned
Site 20 – Wharf Area Sediments	SSA	Planned
Site 21 – Soil Staining at Building 187	SSA	Planned
EPIC AOC #1	SSA	Sampling and geophysics
EPIC AOC #2	SSA	Potential NFA
EPIC AOC #3	SSA	Proposed NFA
EPIC AOC #4	SSA	Proposed NFA
EPIC AOC #5	SSA	Proposed NFA
EPIC AOC #6	SSA	Proposed NFA
EPIC AOC #7	SSA	Proposed NFA
EPIC AOC #8	SSA	Sampling and geophysics
EPIC AOC #9	SSA	Proposed NFA
EPIC AOC #10	SSA	Proposed NFA
EPIC AOC #11	SSA	Proposed NFA
EPIC AOC #12	SSA	Sampling and geophysics

SSA = Site Screening Assessment

RI = Remedial investigation

BLRA = Human Health Risk Assessment; Ecological Risk Assessment

SI = Site Investigation

FS = Feasibility Study

WP = Work Plan (anticipated submittal)

CDM Federal will collect surface and subsurface soil samples at three of the 12 EPIC AOCs (AOCs 1, 8, and 12), and surface water and sediment samples at IRP Site 1 (Landfill A). A geophysical survey will also be conducted at the three EPIC AOCs. The results of this sampling and field effort will be addressed in the SSA reports along with recommended additional action, if any, for these locations. The remaining 9 EPIC AOCs and 8 IRP sites will also be addressed in the SSA report.

Section 3

Initial Evaluation

This section presents an initial evaluation of available background information and existing conditions for the 21 SSA Sites. Although it has been determined that 9 of the 12 identified as EPIC AOCs required no further action (NFA), the Navy is presenting the following information to document that the areas were identified and evaluated; the NFA determination rationale will be provided in the specific site/AOC recommendations of the final SSA report. The rationale for selecting EPIC AOC Sites 1, 8 and 12 for field investigation was developed jointly by the Navy, EPA and VDEQ by reviewing information from previous investigations and the findings from the site visit. Sampling techniques and analytical methods proposed for the SSA field investigation are discussed in Section 4.

Site Background Information

IRP Sites

The IRP sites that will be screened in the SSA are described below. The following site descriptions include physical characteristics, past activities, contaminants detected in previous investigations and observations made during the November 1999 site visit. Some analytical data are available from samples collected from the IRP Sites during the RRR Study. Detections of organic constituents are mentioned in this initial evaluation as an indication of potential contamination at the site. Although inorganic constituents were detected, they are not discussed in the following subsections because naturally-occurring background concentrations have not been documented. Both organic and inorganic constituents analytical data will be screened in the SSA.

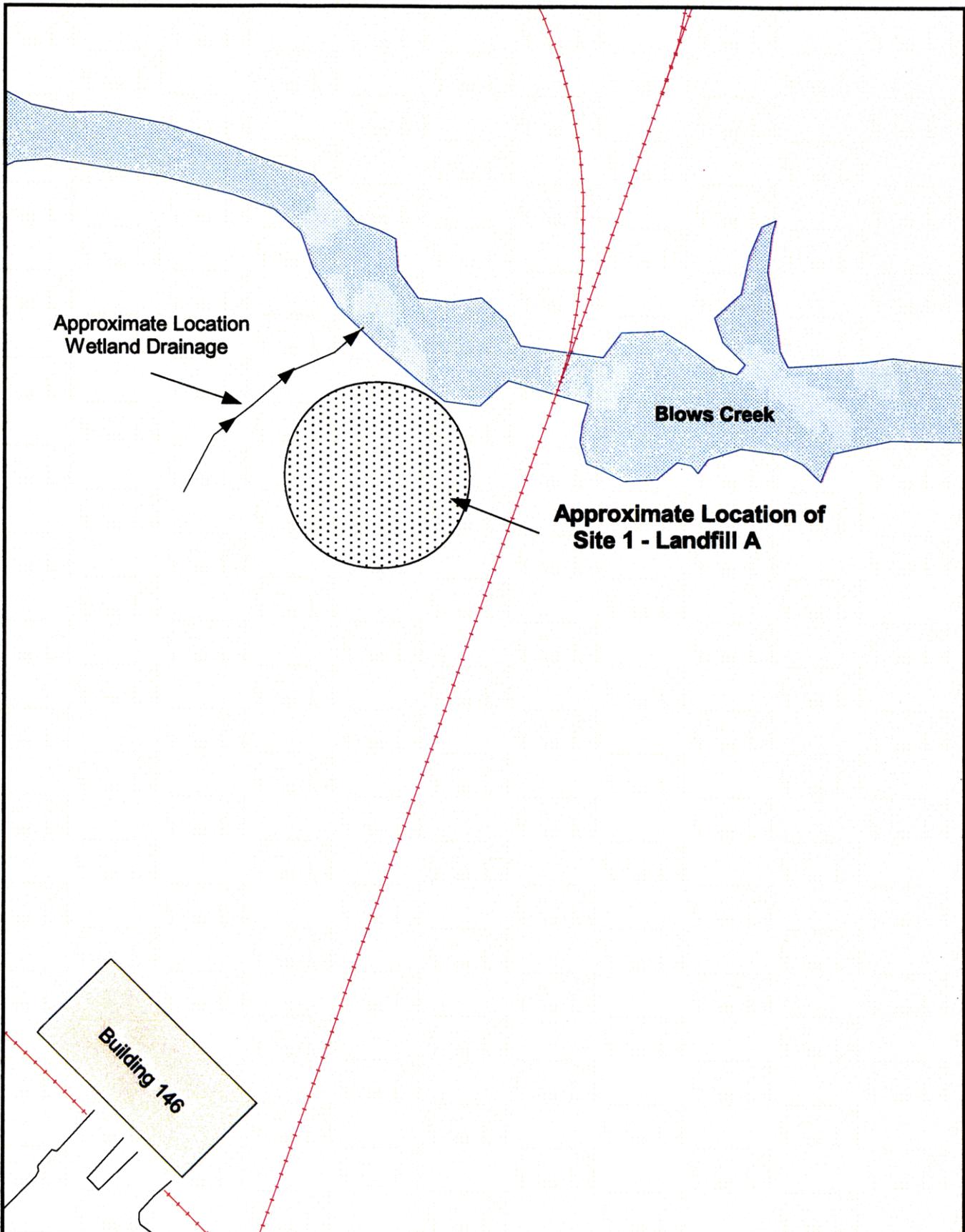
Site 1—Landfill A

The site consists of a one-acre area east of the Virginia Electric Power Company (VEPCO) Right-of Way and west of a set of railroad tracks. The location is shown on Figure 3-1.

As reported in the RFA (A.T. Kearney, 1989), the landfill was used from 1921 to 1924 primarily for the disposal of trash and garbage. Additionally, some pesticides, acids and bases were dumped at the site. Reportedly, the trash was burned at the site and the ashes used to fill the marsh area at the site (adjacent to Blows Creek). The estimated volume of disposed material (prior to being burned) is 30,000 cubic yards.

During the Initial Assessment Study (IAS) (Navy, 1981), no evidence of environmental contamination was noted. NUS conducted a preliminary assessment in 1983 and found no volatile organics in air and no radiation was measured. During the RRR data collection study (CH2M HILL, 1996) two surface soil and two groundwater samples were collected. DDT, DDE and several polynuclear aromatic hydrocarbons (PAHs) were detected in soil, and nitrobenzene was detected in the groundwater.

As part of the Hazard Ranking Scoring (HRS) field investigation (Tetra Tech 2000), surface water and sediment samples were collected from Blows Creek in the vicinity of Landfill A.



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface



0 50 100 Feet

Figure 3-1

Site 1 - Landfill A
 Site Screening Assessment
 St. Juliens Creek Annex

111802V

The data was evaluated by CDM Federal to determine if the locations of the samples and the analytical data could be used to characterize the potential impact (if any) of Landfill A on Blows Creek. The sample descriptions indicate that the downstream sample collected closest to the site was "black sand" while other samples both upstream and downstream of the site had components of silt and organic material. Since both fine-grained material and organic material have a greater tendency to adsorb contaminants, the dominance of sand in the downstream sample may bias the sample toward lower concentrations of contaminants. In addition, the samples were collected during rising (incoming) tide. Based on the evaluation of this data, it appears that there are data gaps that need to be addressed in order to meet the objectives of the SSA.

Site 7—Old Storage Yard

This site consists of a fenced, outdoor grassy area formerly used to store a variety of material including anchors, chain and equipment. The features of the site are shown on Figure 3-2. The startup date for the site is unknown, and as of the 1989 RFA, the site was still active. During previous site investigations, 5-gallon containers of hydraulic oil, lubricating oil, lead paint, and open drums of sandblast grit were observed. Also during the investigations, there was evidence that oil had leaked or was drained onto soil from some of the equipment being stored at the site (A.T. Kearney, 1989).

Two soil samples were collected during the RRR data collection study. Bis (2-ethylhexyl)phthalate is the only organic constituent detected (CH2M HILL, 1996) in those samples.

Site 8—Cross and Mine Site

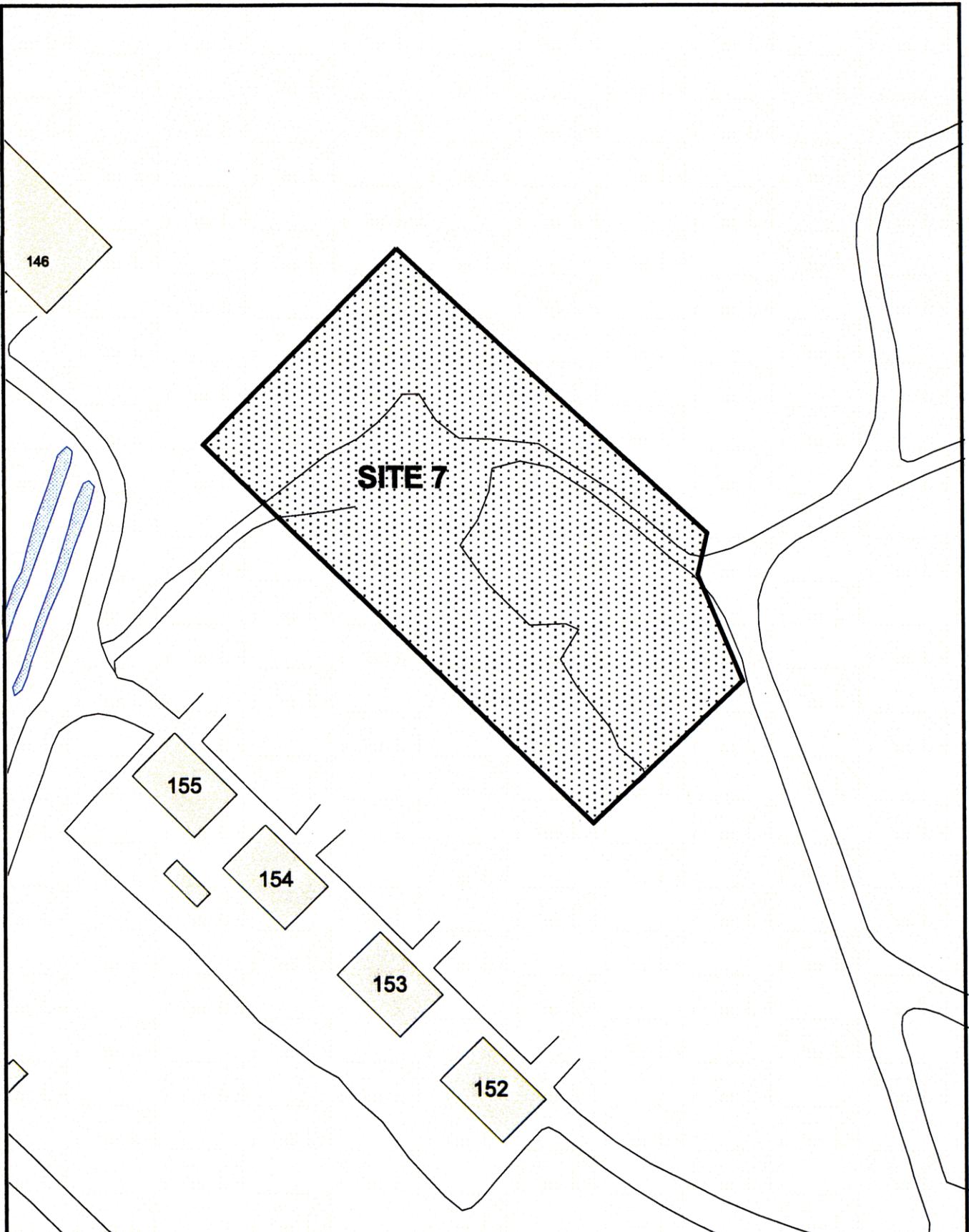
The site is located near the intersection of Cross Street and Mine Road, adjacent to, and north of, Building 212 and across the street from Building M-1 (See Figure 3-3). This site was used for disposal of rinse water from mobile insecticide and herbicide spray trucks from the 1950s to mid 1960s. An estimated 675,000 gallons of rinse water was discharged directly to soil and allowed to infiltrate. Although the IAS report (Navy, 1981) states that the area is "devoid of vegetation", the 1989 RFA notes that the area is grassed over.

The site was included in the 1983 Preliminary Assessment conducted by NUS. No volatile organic compounds were detected in air, and no radiation was measured. During the RRR data collection study, four soil samples and one groundwater sample were collected and analyzed for pesticides and PCBs. Pesticides detected in one or more soil samples include DDT, DDD, DDE, and endrin. No PCBs were detected in the soils and no pesticides or PCBs were detected in groundwater.

Site 10—Hazardous Waste Disposal at Rail Road

This site, shown on Figure 3-4, is located in the vicinity of Building 213. In the RFA report (A.T. Kearney, 1989) the site is reported to be the disposal location for wastes generated during hardware cleaning operations that took place from before 1940 to the mid-1970s. The wastes handled at this location included Alodine (a caustic detergent), methyl ethyl ketone, and acetone. It is reported that liquid wastes were poured on the railroad tracks, although during the Phase II investigation (A.T. Kearney, 1989), no evidence of a release was observed.

The railroad track is currently inactive. Building 213 was observed to be a well-maintained (no evidence of contamination) machine shop. During the RRR data collection study, one



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface

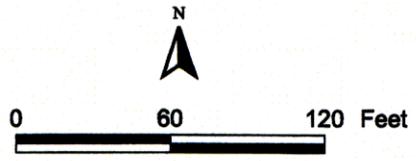


Figure 3-2

Site 7 - Old Storage Yard
 Site Screening Assessment
 St. Juliens Creek Annex

161B03V

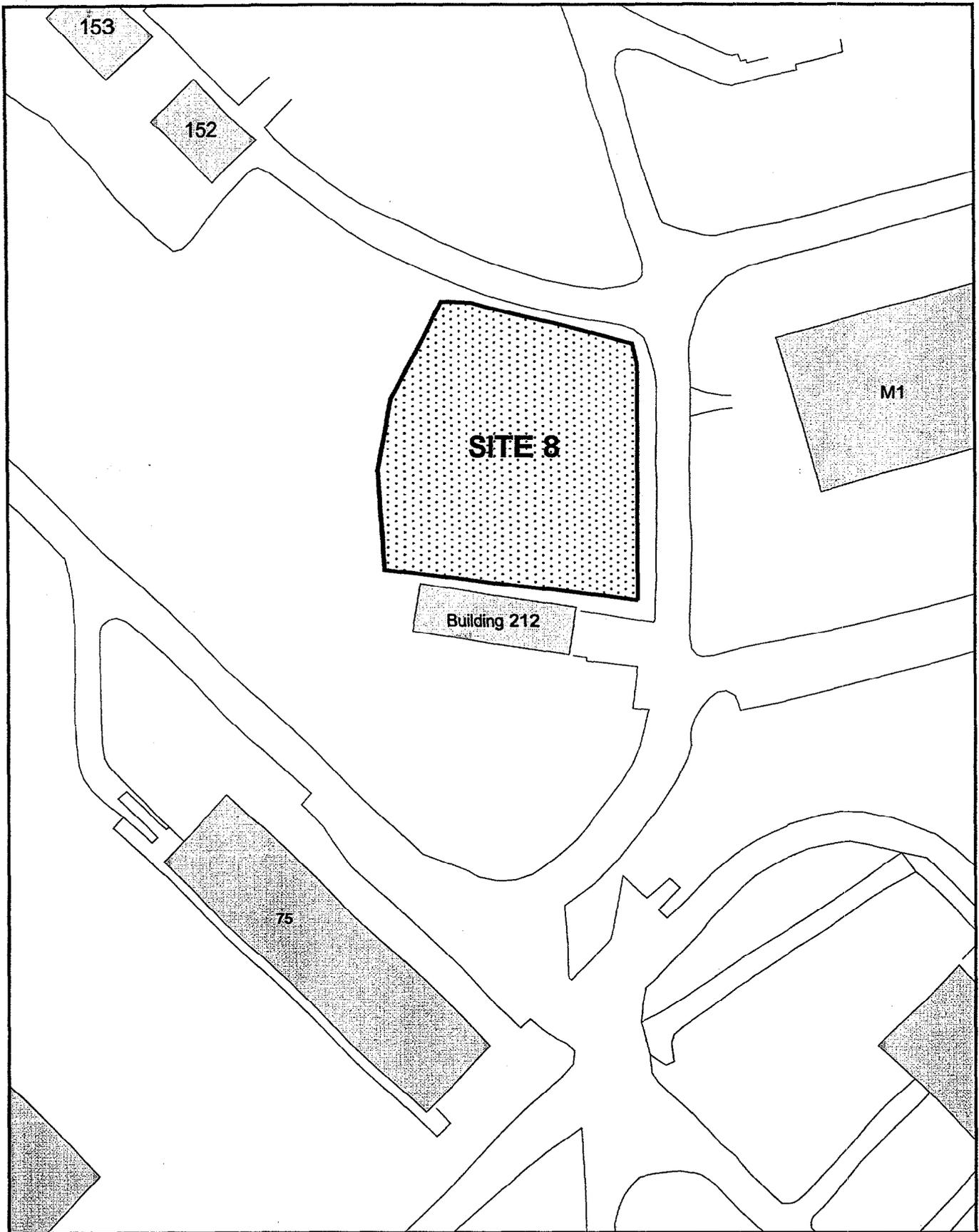
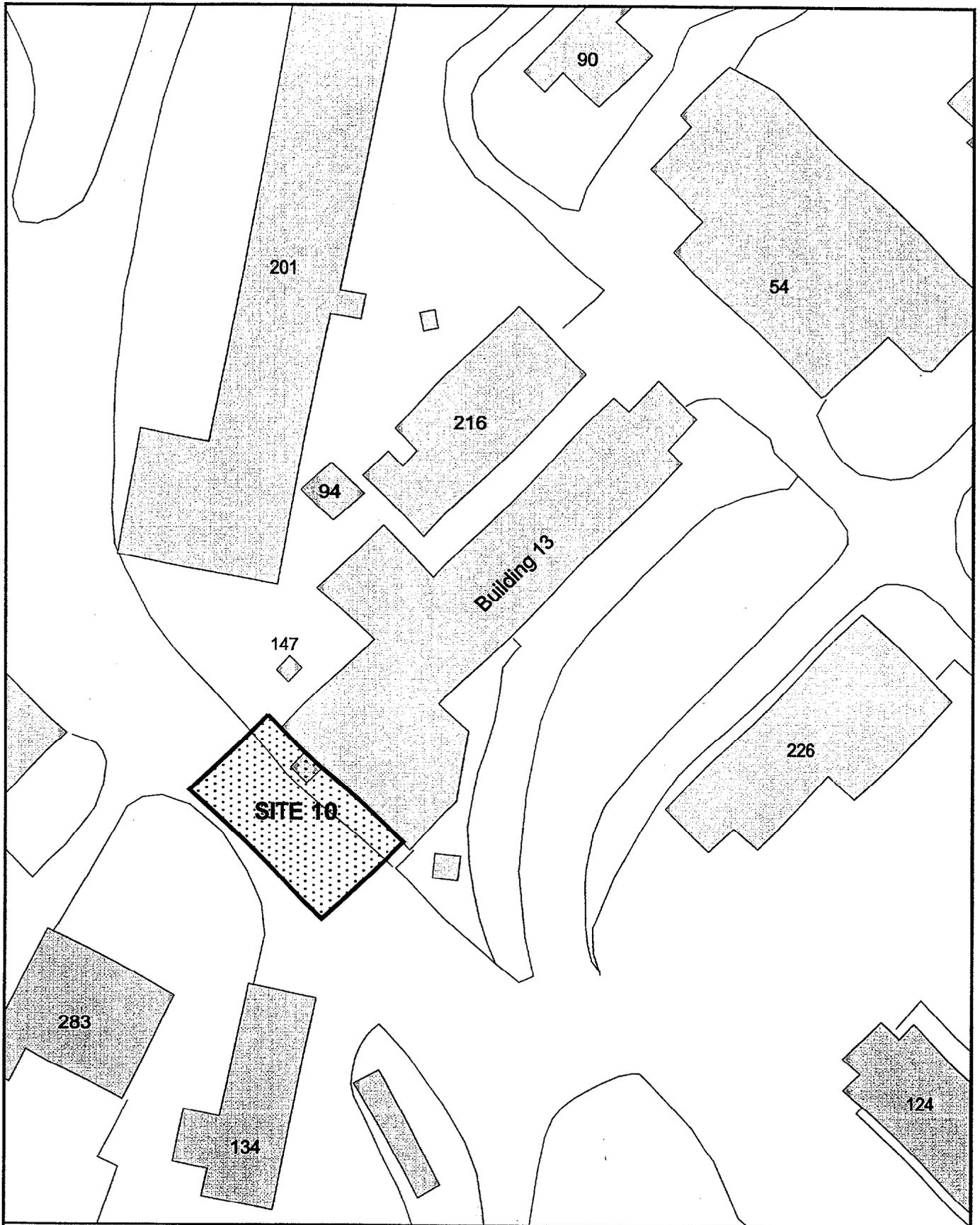


Figure 3-3

Site 8 - Cross and Mine Site
 Site Screening Assessment
 St. Juliens Creek Annex



LEGEND

-  Buildings_General
-  Transportation_Vehicle



0 50 100 Feet



Figure 3-4

Site 10 - Hazardous Disposal Area at Railroad
 Site Screening Assessment
 St. Juliens Creek Annex

groundwater sample and two soil samples were collected. PAHs and methylene chloride were detected in the soil; however concentrations were below the quantitation limit of the analytical instruments. The ground water contained low levels of trichloroethene.

Site 11—Hazardous Waste Disposal at Building 53 (formerly referenced to Bldg. 266)

Building 53 was the facility electrical shop located in the industrial area east of Craddock Street (see Figure 3-5). In the IAS report (Navy, 1981) it was stated that station electricians used 5 gallons per month of trichloroethylene. Most of the solvent evaporated, but the remainder was disposed on the railroad track bed adjacent to Building 53.

By 1989, at the time of the RCRA Phase II site visit (A.T. Kearney, 1989) the building had been converted to a recreation room. No evidence of waste disposal around the building was found. During the RRR data collection study, one groundwater sample and one soil sample were collected in the vicinity on Building 53. The soil sample contained DDT, DDE, dieldrin, endrin, and Aroclor-1260. Several PAHs and trichloroethene were detected at concentrations below the instrument quantitation limit. The groundwater sample contained 1,2-dichloroethene, methylene chloride, and trichloroethene.

Site 18—AOC-A Building 47

Site 18 is located adjacent to the south wall of Building 47 (Figure 3-5). This site was first identified as an area of concern in the 1989 RCRA site visit. During that visit, black sand blasting grit was observed at this location. Although Building 47 does house two sand blasting booths, personnel working in that building reported that they do not use black blasting grit in their machines, therefore the source of the grit is unknown.

One soil sample was collected during the RRR data collection study. The following organic constituents were detected: Bis (2-ethylhexyl)phthalate, several PAHs, carbazole, phenol, and trichloroethene.

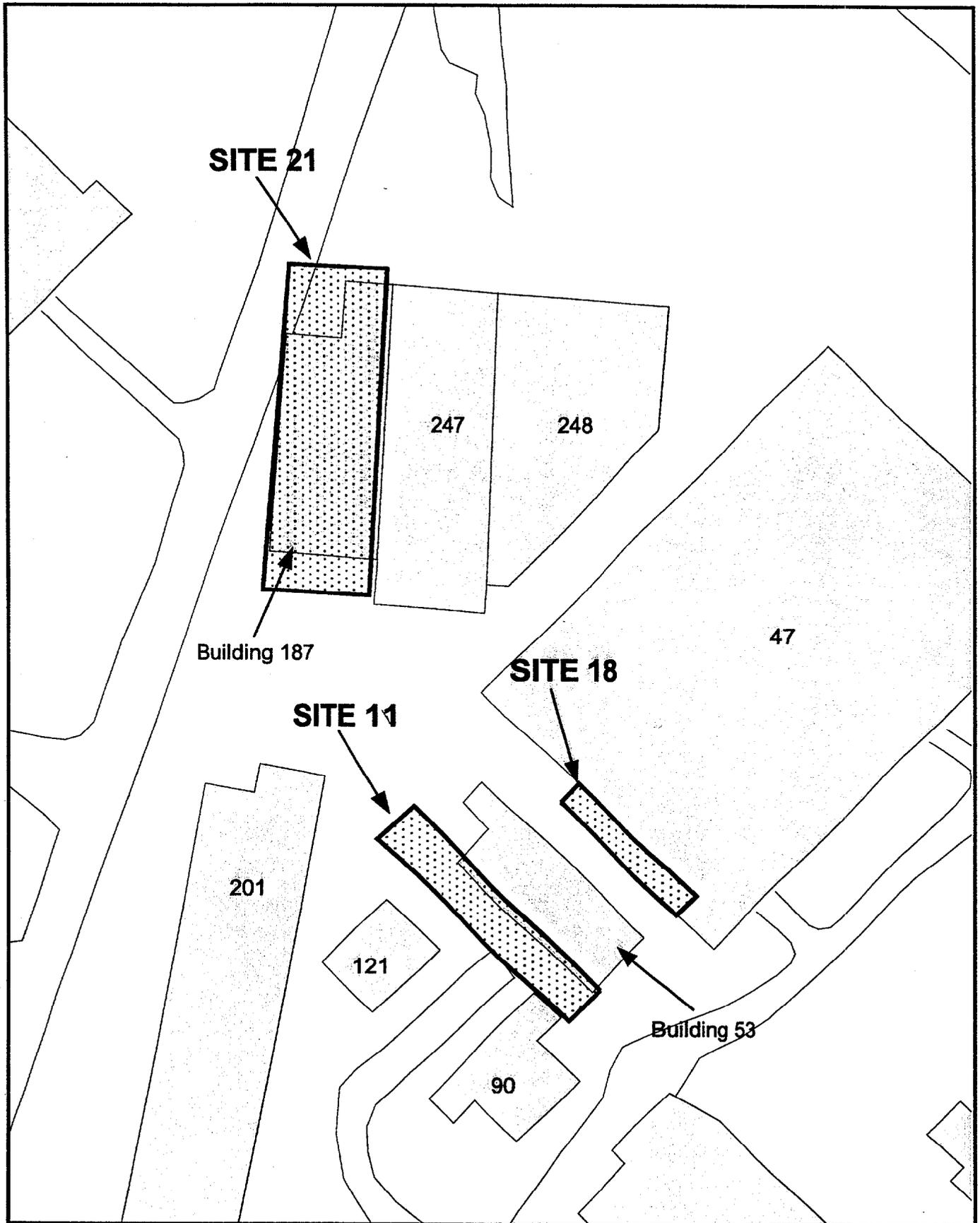
Site 19—Wharf Area Building M-5

This site is located between Building M5 and Building 190 (Figure 3-6). It was reported that various ordnance items may have been dropped in this area during past ordnance management activities (A. T. Kearney, 1989).

During the RRR data collection study soil and groundwater samples were collected. No explosives were detected in the soil samples. Organic constituents that were detected in soil include DDD, DDE, DDT, alpha chlordane, Aroclor-1254, dieldrin, endrin, and several PAHs. Organic constituents detected in the groundwater sample include acetone and methylene chloride.

Site 20—Wharf Area Sediments

This site is located adjacent to the former wharf (Figure 3-6). The IAS concluded that it was likely that ordnance had been dropped into the sediments adjacent to the former wharf during loading and unloading operations. According to the IAS document, Explosive Ordnance Disposal (EOD) Team divers identified some metal and deep silt in the area of the old pier. During the RRR data collection study, an underwater reconnaissance and a magnetometer survey were performed in that area. The magnetometer survey identified approximately 68 buried "contacts" surrounding the former wharf pilings. Many individual contacts were identified in random locations between the pilings. The most significant concentration of contacts is along the center west side of the pilings, between the pilings and the river bank. It is important to note that contacts might indicate any type



LEGEND

-  Buildings General
-  Transportation Vehicle



0 40 80 Feet



Figure 3-5

Site 11 - Hazardous Waste Disposal Area,
 Site 18 - Building 47, Site 21 - Building 187 Soil Staining
 Site Screening Assessment
 St. Juliens Creek Annex

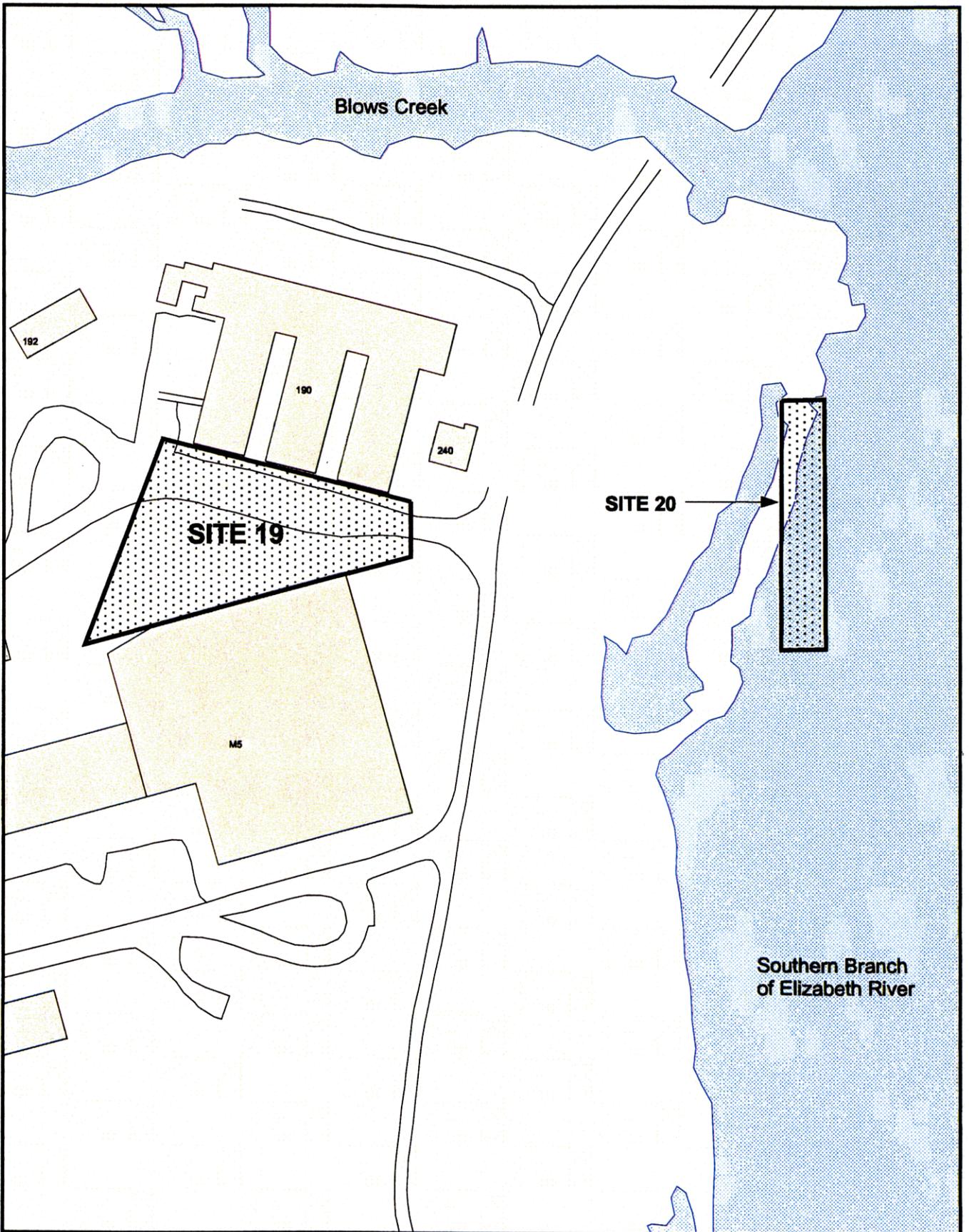


Figure 3-6
 Site 19 - Wharf Area Building M-5
 Site 20 - Wharf Area Sediments
 Site Screening Assessment
 St. Juliens Creek Annex

161B04Y

of buried metal object, and do not necessarily indicate the presence of buried ordnance. No visual confirmation of contacts were made during the RRR data collection study.

During the RRR data collection study, four sediment samples were collected by divers experienced in working at unexploded ordnance sites. These samples were analyzed for explosives, TCL organics (all constituents), and TAL inorganics. One constituent of explosives, 1,3-dinitrobenzene, was detected in one sediment sample at a concentration below the analytical instrument quantitation limit. One pesticide, deta-BHC, several PAHs, and two VOCs (acetone and methylene chloride) were detected.

Site 21— Building 187

Building 187 was a locomotive shed, used for locomotive maintenance (Figure 3-5). The IAS report (Navy, 1981) stated that the area around the locomotive shed is saturated with oil. During the RRR data collection study soil and groundwater samples were collected and analyzed. Pesticides (DDT, DDD, and DDE), Aroclor 1260 and benzo(ghi)perylene were detected at estimated concentrations in soil samples. In addition to several inorganic constituents (including cyanide), groundwater contained acetone, carbon tetrachloride, methylene chloride and trichloroethene.

EPIC-AOCs

EPIC AOC 1— E Street and Marsh Ground Scarring

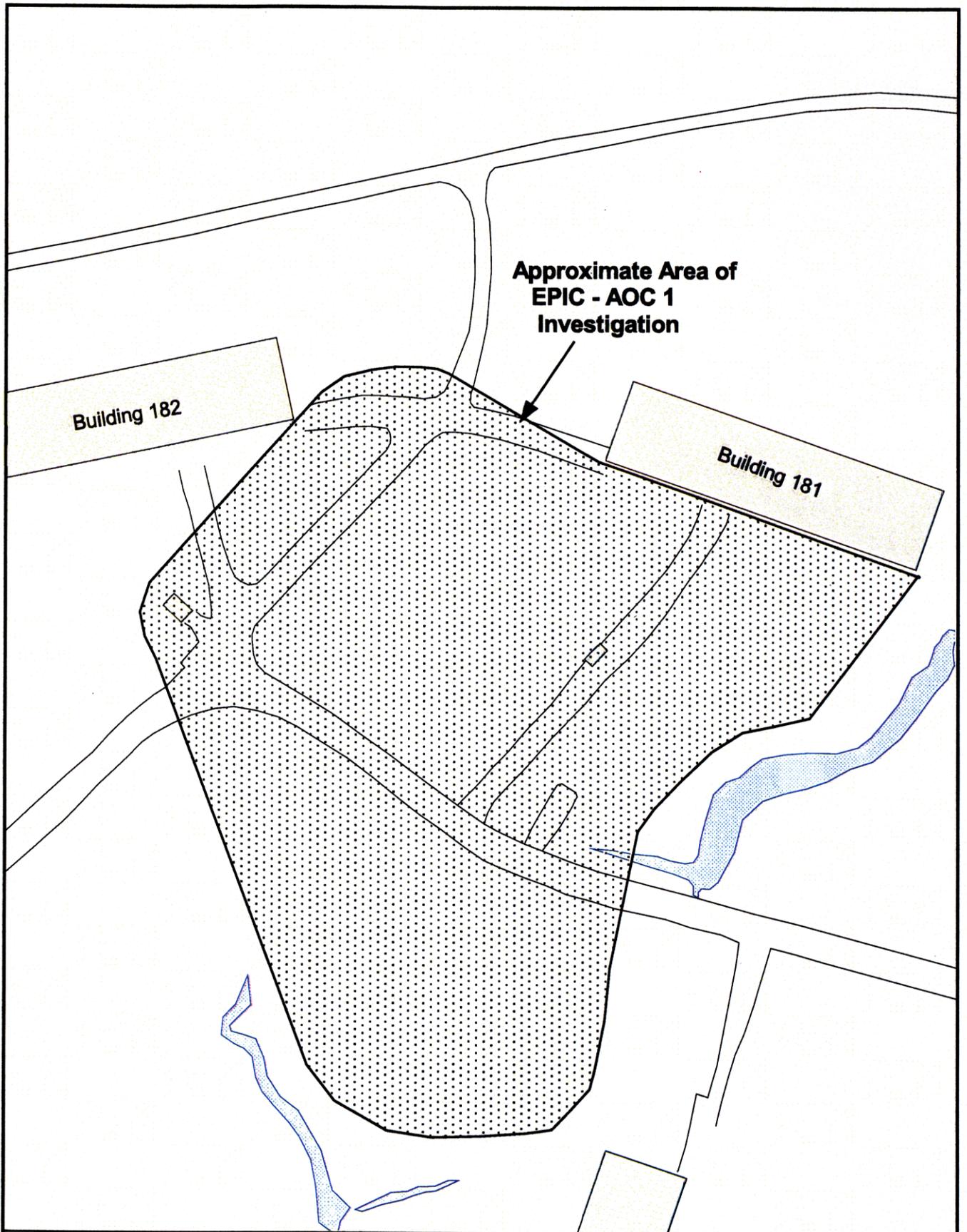
This site is located in the northernmost area of the annex near the intersection of E Street and Marsh Road (see Figure 3-7). The site was identified in the EPIC study interpretation of the 1937 aerial photograph as a possible waste disposal area. Ground scarring, both north and south of Marsh Road, is apparent in the photograph. The area north of Marsh Road is approximately 200 ft by 150 ft, and the area south of Marsh road is approximately 125 ft by 80 ft. By 1949, the date of the subsequent EPIC photograph, the area had been developed and Buildings 182 and 181 were constructed north of, and over part of, the scarring. During the November 1999 site visit, indications (marine shell fragments in the soil) that the area had been filled were found.

EPIC AOC 2 – Piers in Front of Building 83

Storage of possible ordnance materials in the fenced area immediately adjacent to the pier is evident in the 1974 EPIC study photograph. The material appears to be in rows approximately 150 ft long. All SJCA ordnance operations moved to Naval Weapons Station Yorktown in 1977. No releases have been reported in this storage area.

EPIC AOC 3 – Ground Scarring at Building M5

Ground Scarring east of Building M5 was identified by EPA on the April 1949 aerial photograph. The area of scarring is roughly circular and approximately 70 ft in diameter. During a site visit in November 1999, evidence was found indicating that the area had been filled. Review of subsequent aerial photographs indicates that the Annex facility was extended into this area east of Building M5.



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface



0 60 120 Feet



Figure 3-7

EPIC - AOC 1
 Site Screening Assessment
 St. Juliens Creek Annex

EPIC AOC 4 – Parking Area south of Building M1

Soil staining and possible storage tanks in the Building M1 parking area (south of Building M1) were identified in the EPIC Study and by EPA, respectively, in a 1958 aerial photograph. Additional review of aerial photographs indicated that the features identified as tanks may have been trailers, and the apparent soil staining may have been from parked automobiles.

EPIC AOC 5 – Possible Soil Staining Between Buildings 87 and 88

Areas of possible dark staining between Buildings 87 and 88 (located in the central part of the industrial area of the Annex) were identified by EPA in a 1964 photograph. During the November 1999 site visit areas of poor drainage (standing water) were noted. These areas could account for the apparent "dark staining" in the aerial photograph.

EPIC AOC 6 – Ground Scarring East of Site 2

This site was noted on the 1964 EPIC Photograph on the west side of Craddock Street across from IRP Site 2. Although it was identified in the EPIC Study as disturbed ground, subsequent photographs indicate that a high voltage transmission tower was constructed at that location. The ground scarring is thought to be related to tower construction activities.

EPIC AOC 7 – City of Portsmouth Outgrant Area

This area is located on the City of Portsmouth outgrant area, located just off of Victory Avenue and outside the main gate of the Annex. The AOC is located south of the Ballpark and was identified in the EPIC Study as a storage area based on the 1974 photograph. In the 1985 photograph, rows of mounded material are observed. This material is thought to be truck loads of soil staged for filling of the area. By 1986, there is evidence of scarring and ground disturbance as well as mounded material, indicating that filling activities had begun.

EPIC AOC 8 – Possible Waste Disposal/Bulk Storage Area.

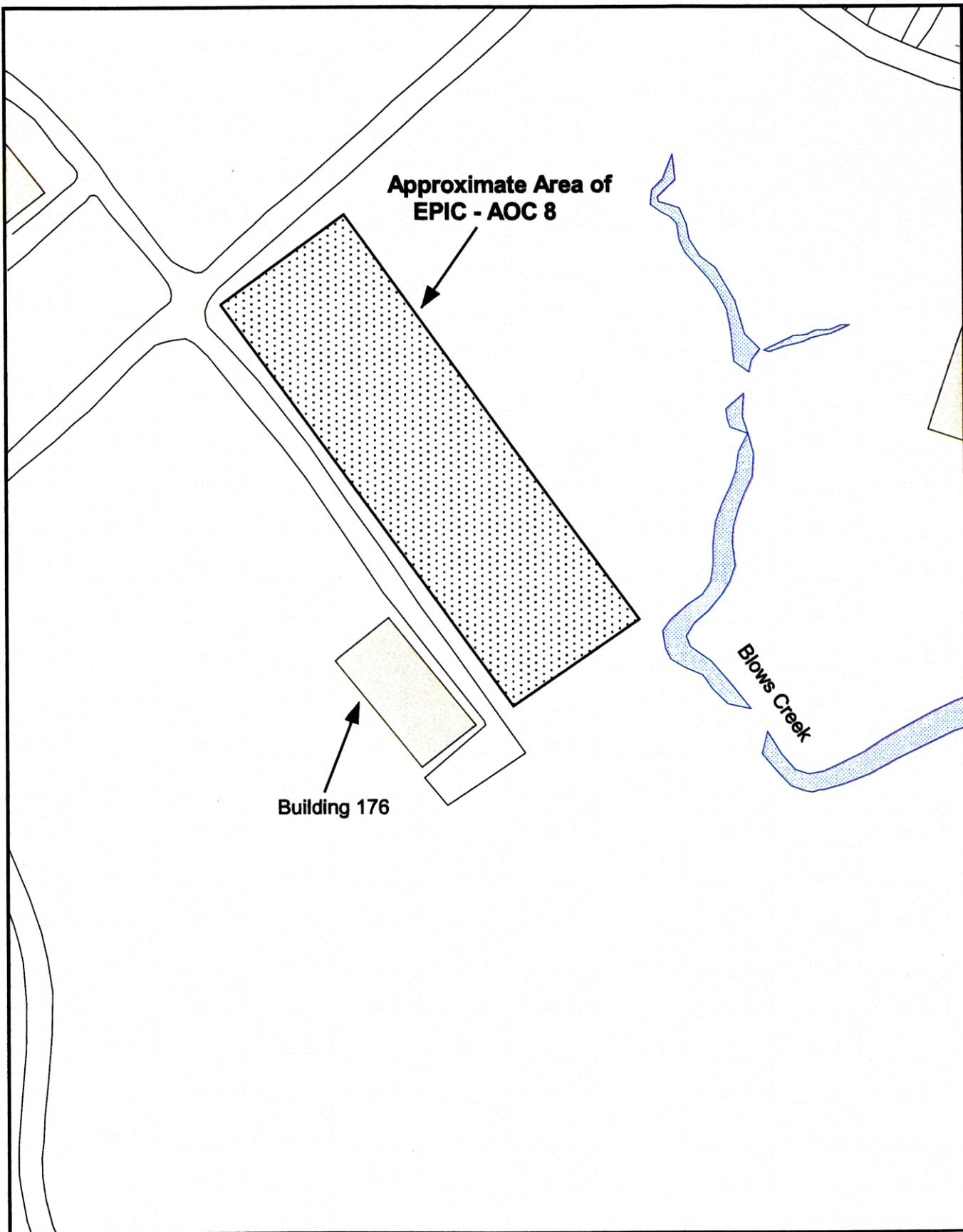
This area, located northeast of and adjacent to Building 176 (see Figure 3-8), was identified by the EPIC study in the 1974 aerial photograph as a possible bulk storage area or waste disposal area. No activity at this location was identified in earlier or later photographs. The area is flat, approximately 300 ft by 60 ft wide, and currently is covered with grass.

EPIC AOC 9 – Ground Scarring Southwest of Building 74

A relatively small area (40 ft by 40 ft) of ground scarring under the steam line approximately 75 ft southwest of Building 74 was identified by EPA in a 1976 aerial photograph. This area is also noted in photographs from the early 1970s and early 1980s.

EPIC AOC 10 – Ground Scarring in Wharf Area

This ground scarring was identified by EPA on a June 1986 aerial photograph in the area of the Wharf, just south of the east end of Building M5. A review of previous photographs (1974) indicate that this area is the former location of Buildings 244, 245, and 256. The scarring is most likely the result of demolition of these buildings between 1974 and 1986.



Approximate Area of
EPIC - AOC 8

Building 176

Blows Creek

LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface

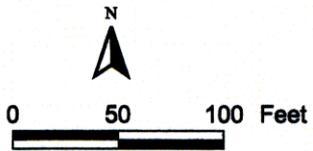


Figure 3-8

EPIC - AOC 8
Site Screening Assessment
St. Juliens Creek Annex

1613064

EPIC AOC 11 – Open Storage Area Northeast of Building 55

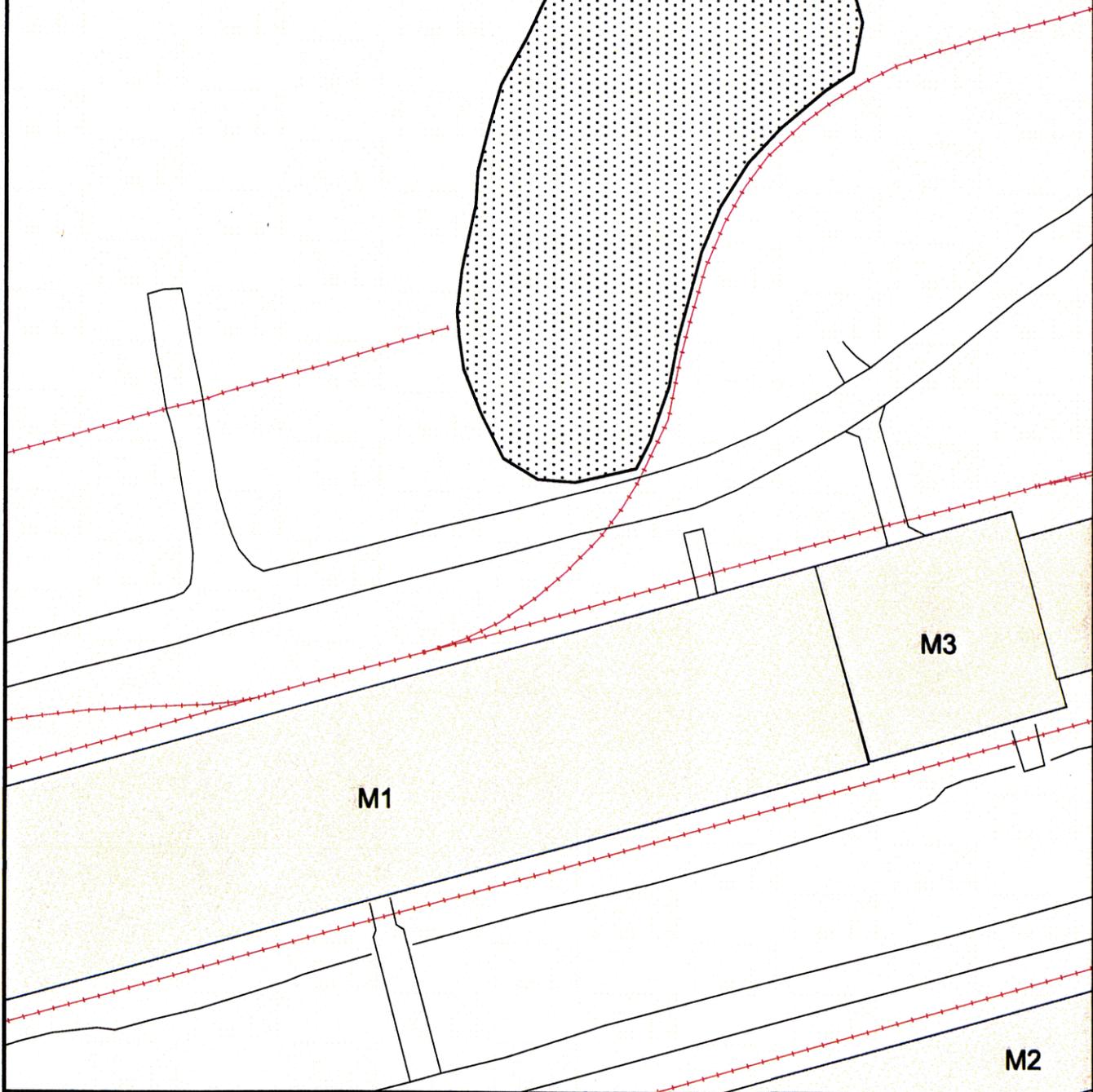
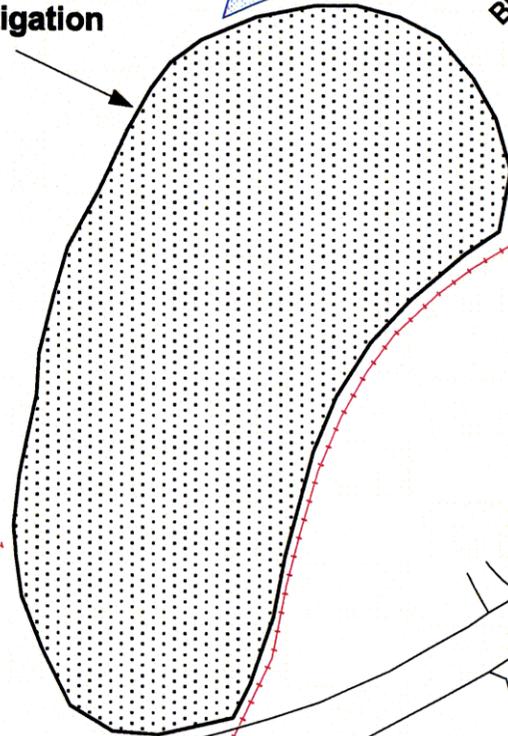
The EPIC Study identified this area, from the 1985 and 1986 photographs, as an area of open storage of drums and material at Building 55 between the Railroad tracks and the road. There is no evidence of storage in this area in previous or subsequent photographs.

EPIC AOC 12 – Sandy Flat

This AOC is approximately 70 ft by 240 ft and is located north of Buildings M-1 and M-5 (see Figure 3-9), directly adjacent to Blows Creek. In a 1937 aerial photograph, the area appears as a marsh. By 1949, the area is devoid of vegetation. In the 1961 and 1964 photographs, the EPIC study notes dark mounded material in the area. During the November 1999 site visit, marine shell fragments were found in the soil, confirming that the area had been filled. The area is still unvegetated, with sandy material at the surface.

Approximate Area of
EPIC - AOC 12
Investigation

Blows Creek



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Transportation_Railroad
-  Hydrography_Surface

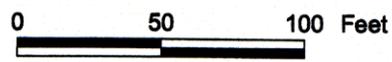


Figure 3-9

EPIC - AOC 12
Site Screening Assessment
St. Juliens Creek Annex

1618074

Section 4

Technical Approach and Work Plan Rationale

This section details the technical approach developed to perform the SSA activities. The tasks included in the technical approach are listed below. The remainder of the section contains a detailed discussion of each task.

Task 1 - Project Planning

Task 2 - Field Investigation

Task 3 - Sample Analysis and Data Validation

Task 4 - Site Screening Assessment Report/Closeout Reports

Task 1: Project Planning

This task consists of project management, meetings, and the preparation of this work plan.

Project Management

The project management activities include daily technical support and guidance, budget and schedule review and tracking, preparation and review of invoices, personnel-resource planning and allocation, subcontractor coordination, preparation of monthly progress reports, and communication and coordination of events with LANTDIV and the Annex. Project management will occur over the duration of the project, which is estimated to be completed in 10 months.

Meetings

Two two-day meetings are planned for this assignment to develop the preliminary problem formulation for the ecological risk assessment, finalize sampling issues, and discuss data screening and evaluation methods. Participants in the meetings will include the VDEQ, USEPA, BTAG, the CDM Federal and CH2M HILL Activity Managers, CDM Federal Project Manager, and the Senior Ecologist. One Meeting was held in November 1999 in conjunction with a site visit to review the IR sites, SWMUs, and AOCs on the Annex.

Work Plan

A Final Master Work Plan (WP), Final Master Sampling and Analysis Plan (SAP), and Final Master Health and Safety Plan (HASP) have been prepared for the activities to be performed for IRP investigations St. Juliens Creek (Final Master Project Plan, St. Juliens Creek Annex, July 2000). The Final Master SAP consists of three documents: the Master Field Sampling Plan (FSP), the Master Quality Assurance Project Plan (QAPP), and the Master Investigation-Derived Waste Management Plan (IDWMP). LANTDIV, EPA and VADEQ agreed during the February 25, 2000 work-in-progress meeting/site visit that the Final Master plans will be used to streamline future investigation work plans and to provide the background information needed to understand base-wide site conditions, the approach to be used for investigations and general types of activities to be accomplished.

Site-specific details will be provided in the site-specific plans. The site-specific plans will supplement the Master Plans and will present information specific to each site. The site-specific work plans (HASP, FSP, QAPP, and IDWMP) are presented as checklists of items based on the existing Master Work Plans (including other supporting documentation, and additions/deviations from the Master Plan). A set of site specific plans has been developed for each site or AOC where field work is planned for the SSA. These site-specific plans are compiled in Attachment A to this Work Plan.

The following presents a description of each element of the site-specific work plans.

- Site-Specific Work Plan: The site-specific Work Plan describes the site background; previous investigations and analytical results; location of the site in relation to the entire Base; discussion of field activities to be performed at the site; staff organization and task order management; and the task order schedule.
- Site-Specific Field Sampling Plan Checklist: The site-specific Field Sampling Plan checklist describes the field tasks to be performed; the field measurements to be taken; the sampling program (i.e. nomenclature); sampling locations; and applicable standard operating procedures (SOPs).
- Site-Specific Quality Assurance Project Plan Checklist: The QAPP checklist describes the data quality objectives (DQOs); samples to be collected and analyses to be performed; analytical quantitation limits; quality assurance/quality control (QA/QC) acceptance criteria; data reduction, validation, and reporting; internal QC procedures (field and laboratory); and corrective action.

The QAPP describes the Quality Assurance and Quality Control procedures used for conducting sampling and analytical activities. In addition, field sampling will not begin at any site until the Navy Technical Representative (NTR) receives confirmation that laboratory QAPP requirements have been met for the sites. The subcontracted analytical laboratory will conform to their approved Laboratory Quality Assurance Plan (LQAP). In addition, CH2M HILL will prepare and meet the QAPP requirements as specified by the Navy

- Site-Specific Investigation-Derived Waste Plan Checklist: The IDWMPs will describe procedures used for the handling and disposal of waste materials generated during the SWMU/AOC investigations. These waste materials are expected to be minimal, and will include personal protective equipment and decontamination fluids. The plans also describe the potential means of disposal, if deemed necessary.
- Site-Specific Health and Safety Plan Checklist: The site-specific addresses activity-specific precautions, such as HAZWOPER-regulated tasks; hazards of concern; contaminants of concern; personnel; instrumentation required; and decontamination procedures.

The HASP will be reviewed and approved by both the NTR and the Safety/Health Officer of the facility. This plan governs all aspects of the project.

To prevent accidents, the onsite portion of the study shall not begin until this plan has been approved by the NTR.

Task 2: Field Investigation

This task comprises procedures for subcontractor procurement, mobilization and demobilization, utility-clearance procedures, sampling and geophysical surveys.

Field Work Support Activities

Subcontractor Procurements

As part of the initial field mobilization to St. Juliens Creek Annex, CH2M HILL will procure (for CDM Federal) geophysical, surveyor, IDW, analytical laboratory, and data validation services for work at St. Juliens Creek. The analytical laboratory will meet NFESC Level D quality control. The firms providing these services shall be procured using the Basic Ordering Agreements (BOAs) under the CLEAN II contract. In cases where BOAs are not in place for services required under this task order, CH2M HILL will provide subcontractor services in accordance with procedures that will be established between CH2M HILL's contract administrator and LANTDIV's contracting officer.

Mobilization/Demobilization

Mobilization includes procurement of necessary field equipment, and initial transport to the site. Equipment and supplies will be brought on site when the CDM Federal field team mobilizes for field activities.

Demobilization activities include time for general site restoration prior to the return of field equipment and crew. IDW generated during field activities will be minimal and containerized in one 55-gallon drum. The 55-gallon drum will be properly labeled and stored at a location designated by LANTDIV and St. Juliens Creek Annex prior to disposal.

The disposal method will be dependent on SSA analytical results.

Utility Clearance

Utility clearances will be performed prior to the start of any subsurface investigation activities at the site. CDM Federal will coordinate subsurface utility clearances with the Miss Utility group and the Public Works Center (PWC) at St. Juliens Creek. CDM Federal will be responsible for insuring that all appropriate contacts have been made with Base personnel and that clearances have been given for proposed sample locations, including marking of utilities near the areas of handauger sample locations, prior to the initiation of field operations. CDM Federal may subcontract a private utility clearing subcontractor if this service is not provided by the government.

Geophysical Surveying

Three sites (EPIC AOC 1, EPIC AOC 8 and EPIC AOC 12) have been identified in the EPIC study as potential waste disposal areas. During the field investigation, geophysical techniques will be used to attempt to locate contamination or buried waste. Electromagnetic (EM) induction will be used at each of the AOCs. In the EM induction

method a high-energy electromagnetic field is transmitted into the subsurface and secondary fields produced by eddy currents are measured. The strength of the secondary current is related, in part, to the conductivity of the subsurface. Therefore, changes in subsurface conductivity, that might be due to contamination or buried waste, can be detected. A complete explanation of the EM method and the procedures used for conducting the surveys are located in SOP 8.3 attached to the Final Master Field Sampling Plan (CDM Federal 1999).

The location of the geophysical survey transects that will be performed at EPIC AOCs -1, 8, and 12 are shown on Figures 4-1, 4-2, and 4-3, respectively.

Soil Sampling

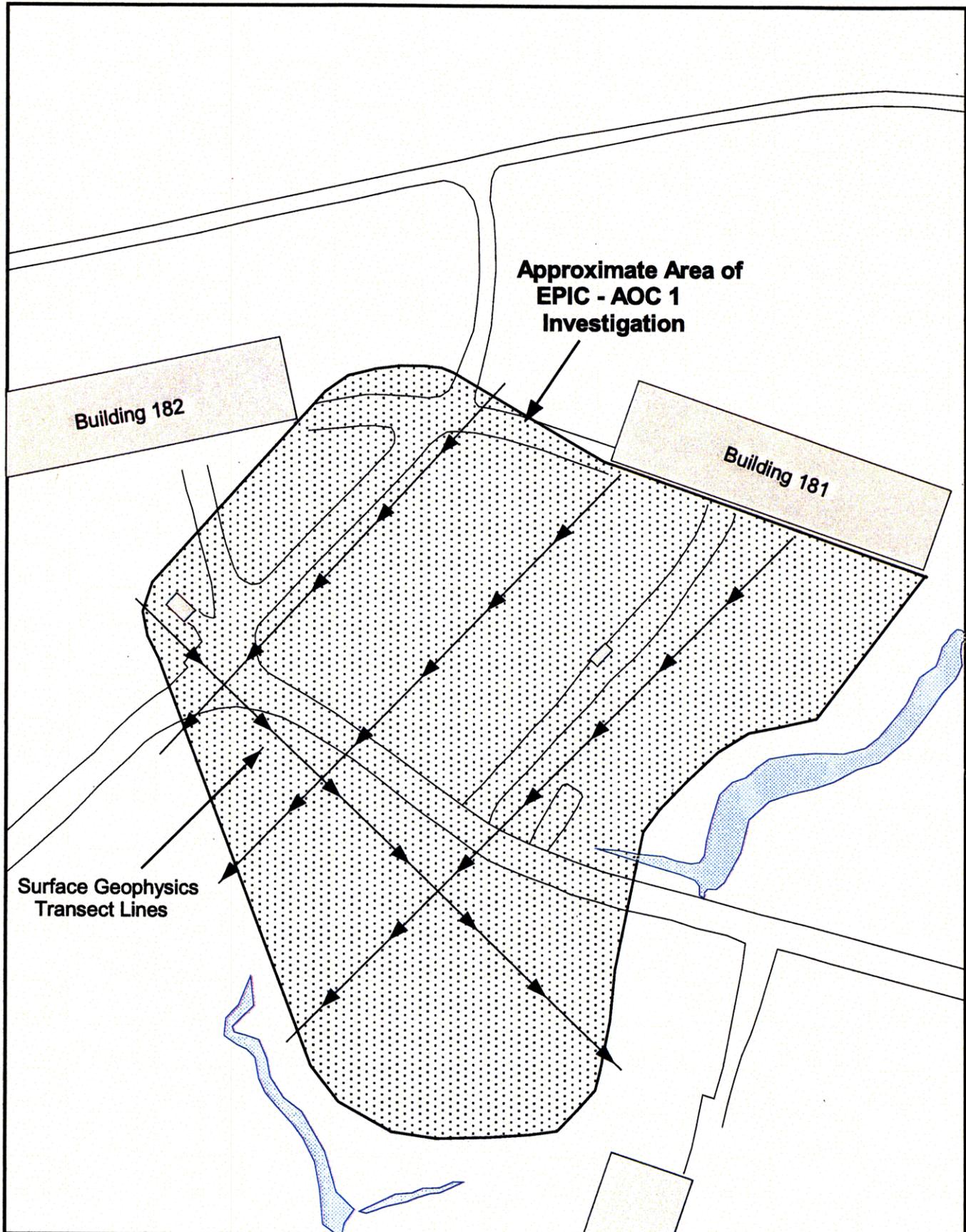
The goal of the soil sampling effort is to provide analytical data for three potentially new sites at St. Juliens Creek Annex. These data will be screened in the same way as the existing data (RRR study) for the other sites (see Site Screening Report, below). The soil samples to be collected for the SSA are shown in Table 4-1.

Site	# Surface Soil Samples	# Subsurface Soil Samples
EPIC AOC 1 E Street and Marsh Ground Scarring	4	4
EPIC AOC 8 – Bldg 176 Possible Waste Disposal Area	3	3
EPIC AOC 12 – Ground Scarring by Bldgs. M1 and M5	3	3
Totals	10	10

Soil Sample Numbers and Locations

A total of 10 surface soil and 10 subsurface soil samples will be collected from the three sites. Surface soil samples will be collected at depths of 0 – 6 inches bgs. The subsurface soil samples will be collected from a depth of 1 to 3 feet with a stainless steel hand auger. Surface and subsurface samples will be collected from the same locations.

Figures 4-4 through 4-6 show the preliminary proposed locations of soil samples for the three sites. The sample locations were selected to provide a good spatial distribution. Various field conditions, such as the presence of underground utilities or information on

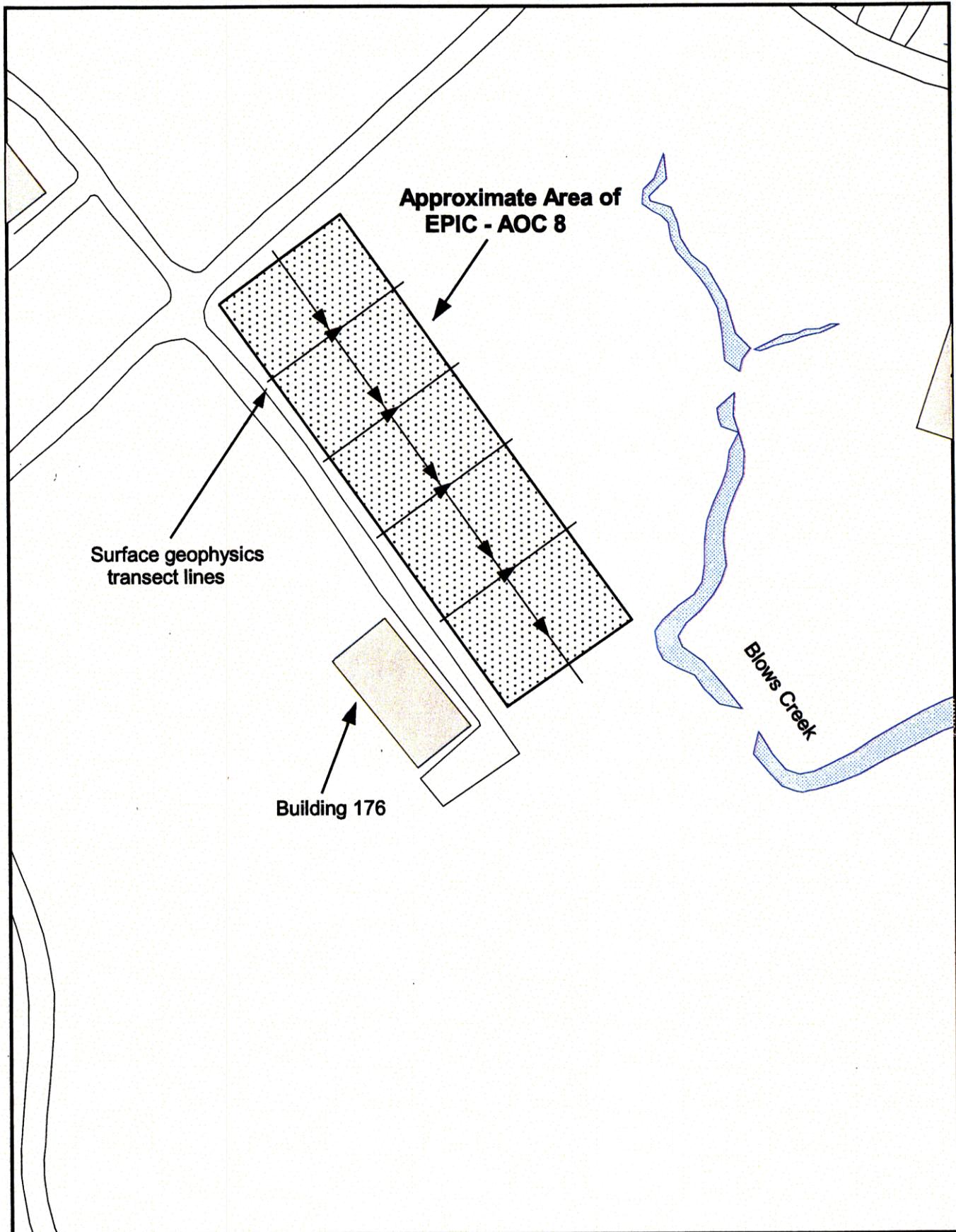


LEGEND

- Buildings_General
 - Transportation_Vehicle
 - Hydrography_Surface
 - Surface Geophysics Transect
- 0 60 120 Feet

Figure 4-1
 Proposed Surface Geophysics Area
 EPIC - AOC 1
 Site Screening Assessment
 St. Juliens Creek Annex

161BB84



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface
-  Surface Geophysics Transects

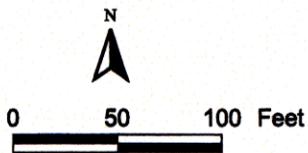
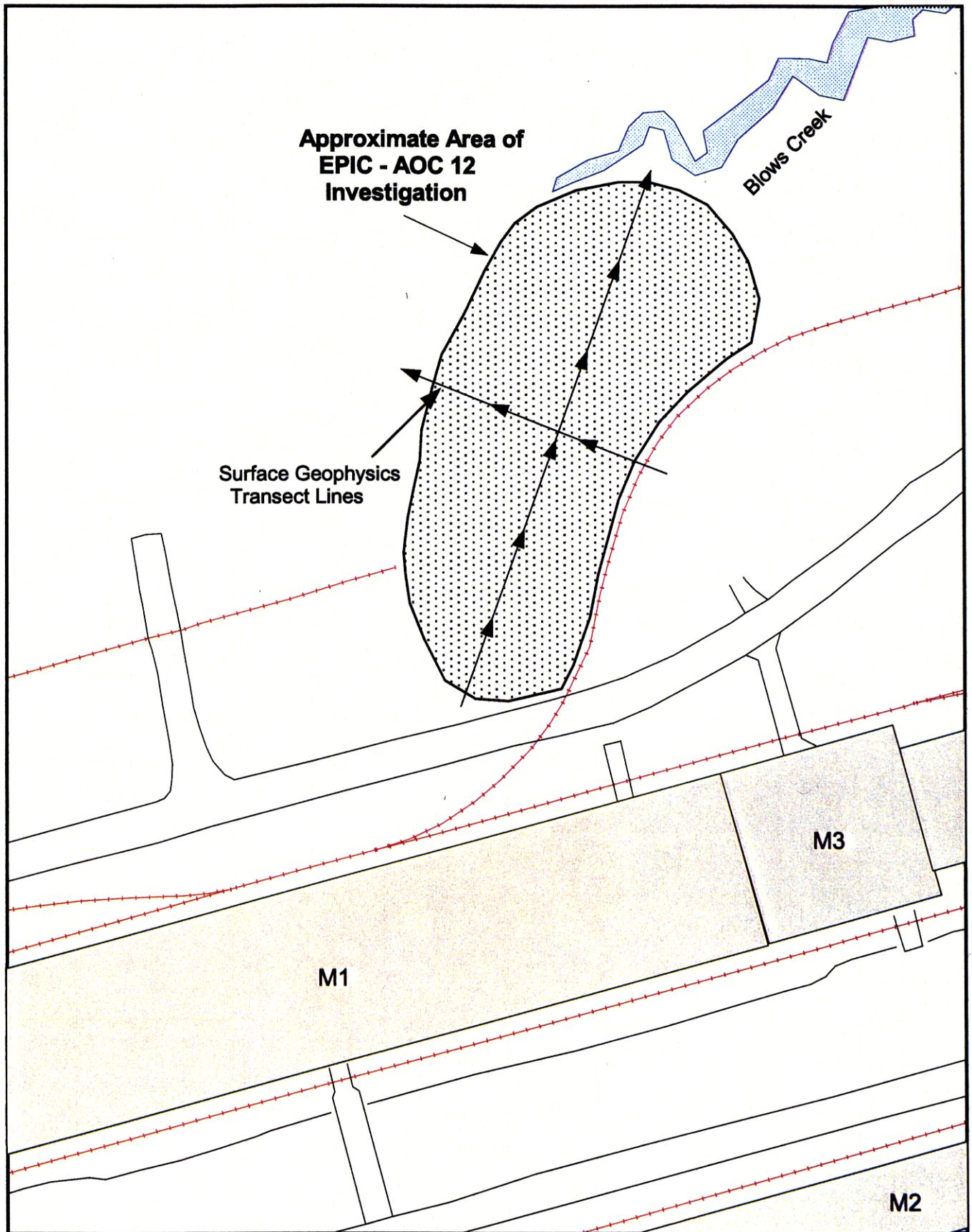


Figure 4-2
 Proposed Surface Geophysics Area
 EPIC - AOC 8
 Site Screening Assessment
 St. Juliens Creek Annex



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Transportation_Railroad
-  Hydrography_Surface
-  Surface Geophysics Transect

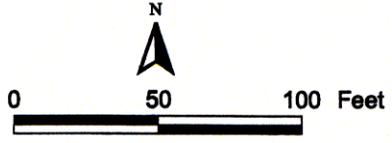
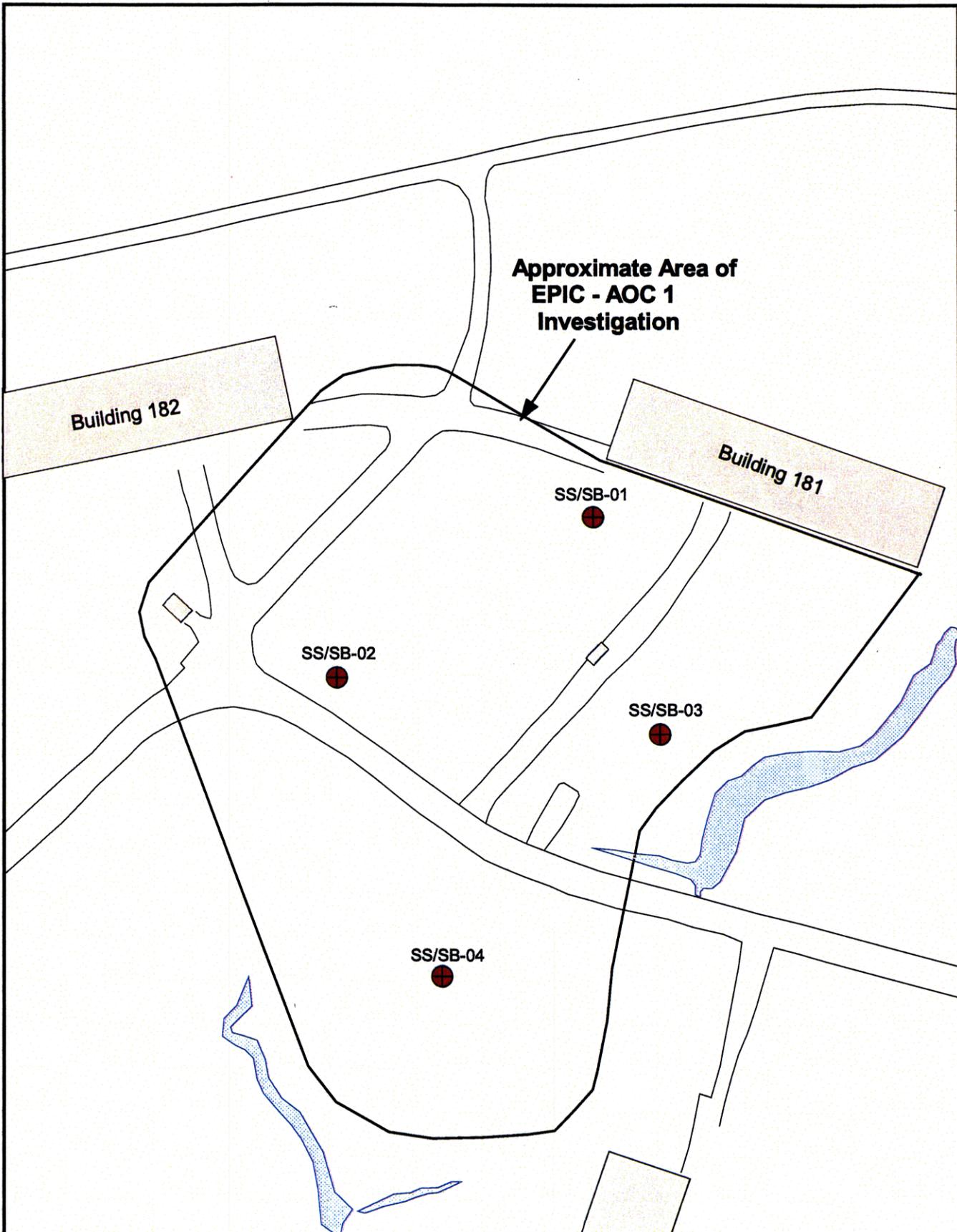


Figure 4-3
 Proposed Surface Geophysics Area
 EPIC - AOC 12
 Site Screening Assessment
 St. Juliens Creek Annex

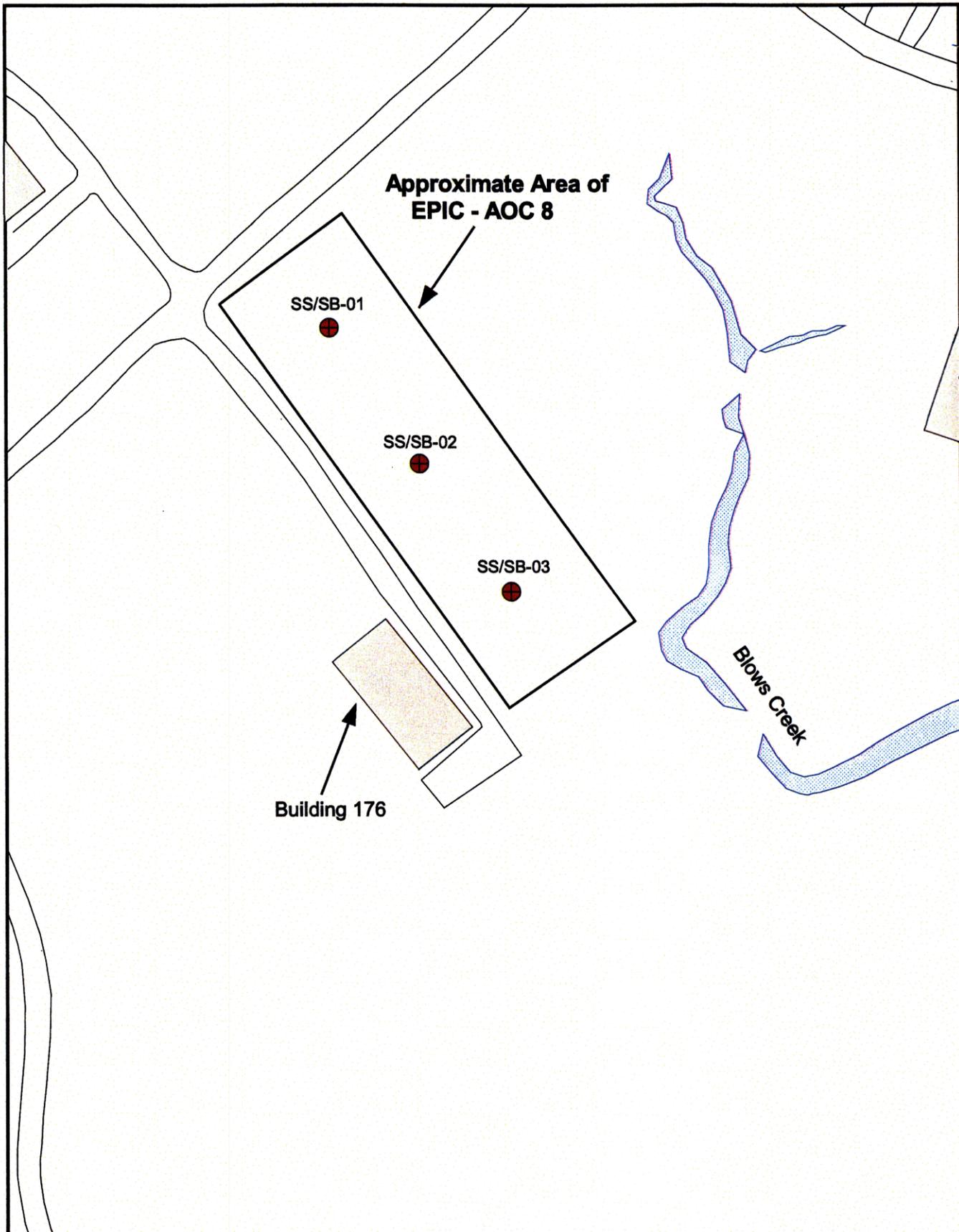


LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface
-  Surface/Subsurface Soil Sample



Figure 4-4
 Proposed Surface/Subsurface Soil Sample Locations
 EPIC - AOC 1
 Site Screening Assessment
 St. Juliens Creek Annex



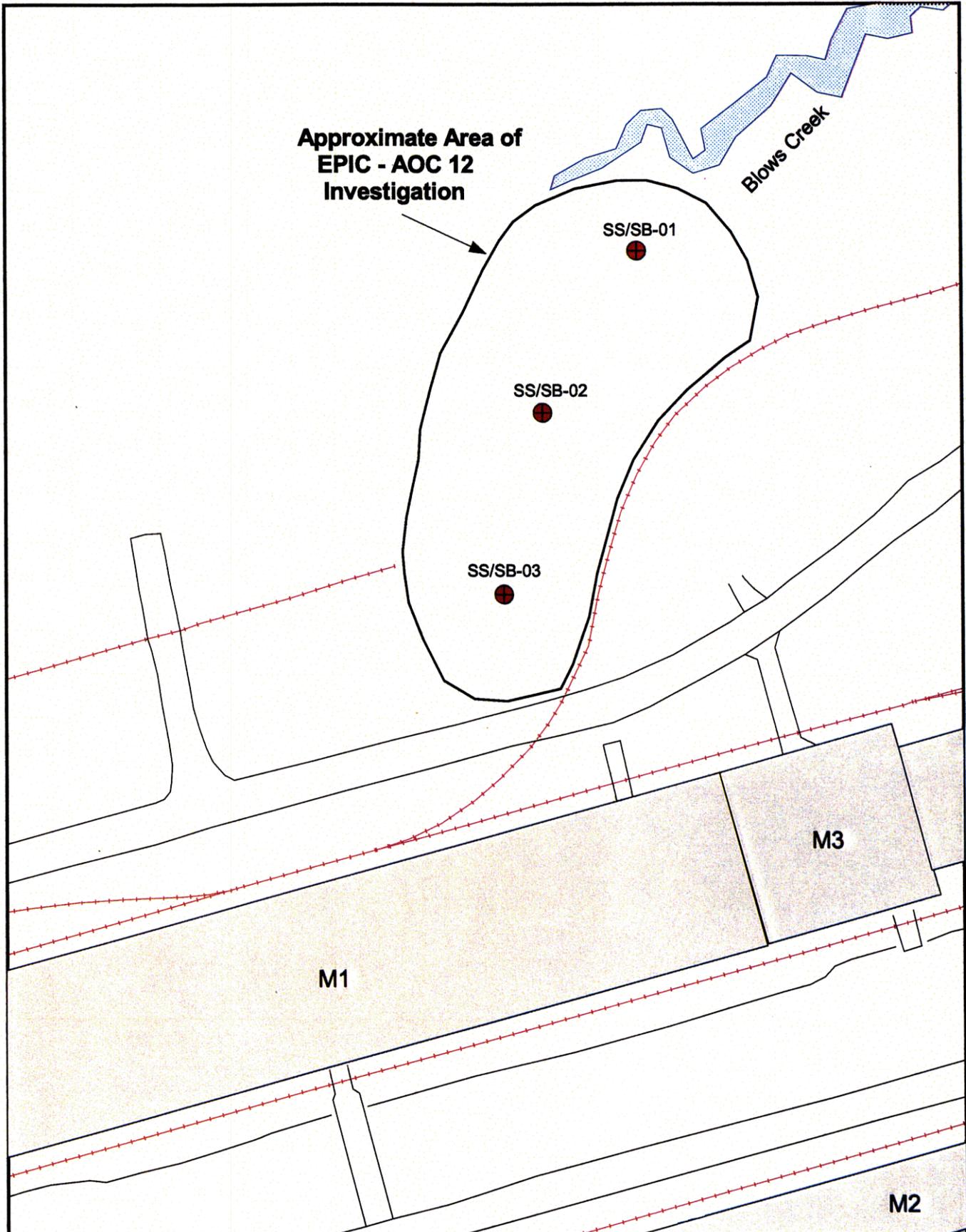
LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface
-  Surface/Subsurface Soil Sample



0 50 100 Feet

Figure 4-5
 Proposed Surface/Subsurface Soil Sample Locations
 EPIC - AOC 8
 Site Screening Assessment
 St. Juliens Creek Annex



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Transportation_Railroad
-  Hydrography_Surface
-  Surface/Subsurface Soil Sample



0 50 100 Feet

Figure 4-6
 Proposed Surface/Subsurface Soil Sample Locations
 EPIC - AOC 12
 Site Screening Assessment
 St. Juliens Creek Annex

the presence of buried waste or other targets determined by the geophysical surveys, will be considered when selecting the final sampling locations.

The surface and subsurface soil samples collected will be analyzed for Target Analyte List (TAL) metals, Target Compound List (TCL) VOCs, TCL semivolatile organic compounds (SVOCs), TCL pesticides/PCBs, explosives, and LC-PAH. EPA standard methods, including Contract Laboratory Program (CLP) procedures, will be followed during sample analysis. Details concerning the analytical methods and Quality Assurance/Quality Control sampling are located in the Site-Specific QAPP.

Soil Sampling Techniques

Both surface and subsurface soil samples will be collected according to the sampling techniques described in Final Master Field Sampling Plan (See SOPs 4.1 Soil Sampling, 4.2, and Shallow Soil Sampling).

Surface Water and Sediment Sampling

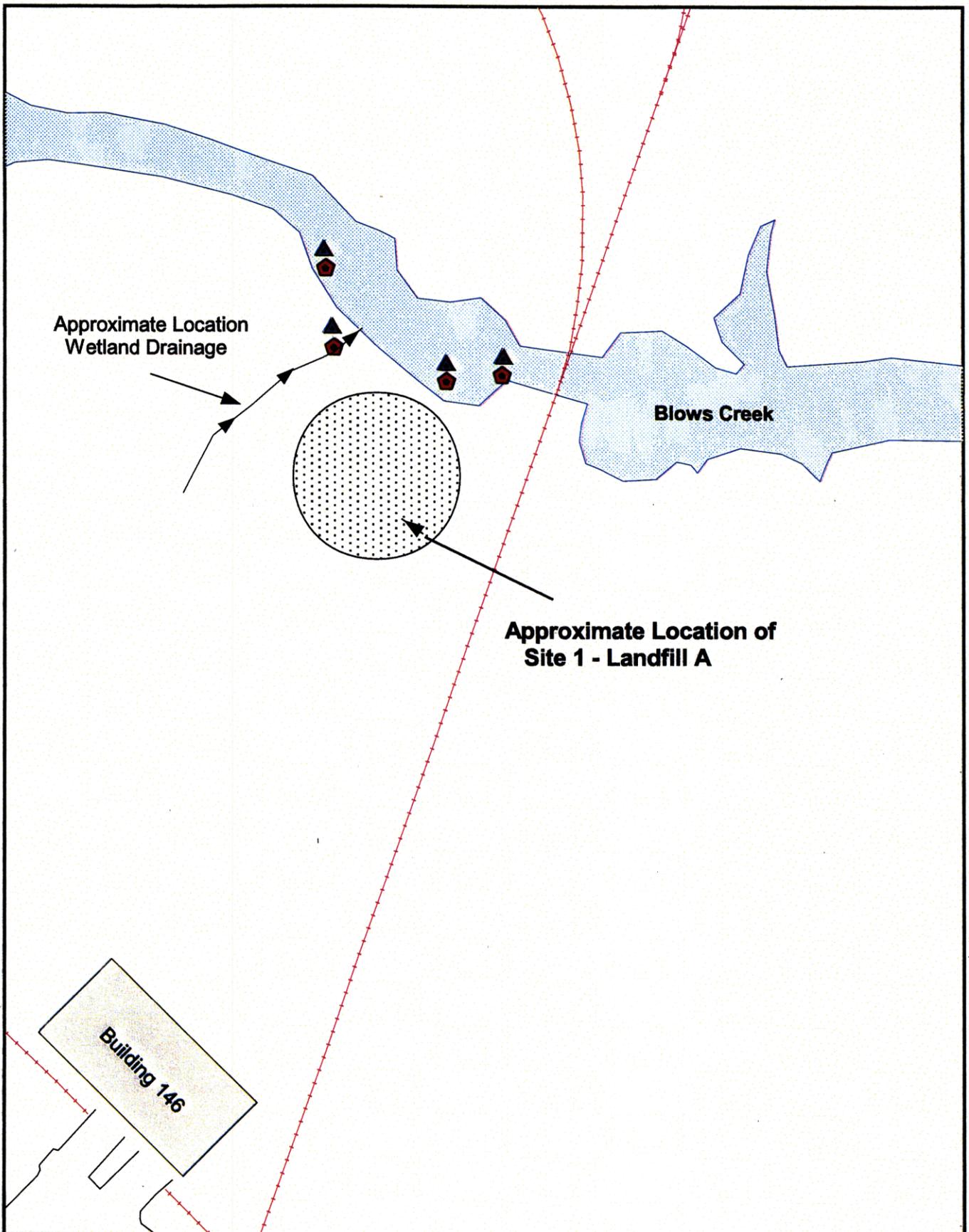
Four surface water samples and four sediment samples will be collected to determine potential impacts on Blows Creek from Landfill A (Site 1). The surface water and sediment samples will be collected during outgoing low tide. The locations and numbers of surface water and sediment samples and analytical methods are specified below.

Surface Water and Sediment Sample Numbers and Locations and Analyses

Surface water and sediment samples will be co-located at the four locations shown on Figure 4-7. One sampling location will be approximately 100 ft upstream of Site 1 to provide reference concentrations. All surface water samples will be analyzed for Low-concentration VOCs, TCL SVOCs, TCL pesticides/PCBs, TAL inorganics, alkalinity, hardness, BOD, COD, total suspended solids, and total dissolved solids. Standard EPA analytical methods will be followed. Temperature, pH, conductivity, and dissolved oxygen will be measured and recorded in the field. The sediment and surface water samples to be collected for the SSA are shown in Table 4-2.

Table 4-2 Summary of Sediment and Surface Water Samples		
Site	# Sediment Samples	# Surface Water Samples
Site 1 – Landfill A	4	4

All sediment samples will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, and LC-PAH, explosives, TAL inorganics, total organic carbon, particle size analysis, pH and Eh. Standard EPA methods will be followed for organics, inorganics and TOC analysis. ASTM Method D-422 will be used for particle size analysis and pH and Eh will be measured in the field.



LEGEND

-  Buildings_General
-  Transportation_Vehicle
-  Hydrography_Surface
-  Proposed Sediment Sample
-  Proposed Surface Water Sample

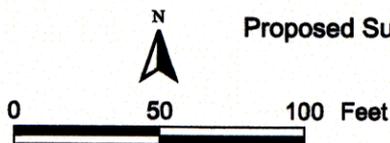


Figure 4-7
 Proposed Surface Water/Sediment Sample Locations
 Site 1 - Landfill A
 Site Screening Assessment
 St. Juliens Creek Annex

1112004

Surface Water and Sediment Sampling Techniques

Surface water and sediment sampling techniques are described in the Final Master Field Sampling Plan (see Site Specific FSP Checklists). Because some potential contaminants may adhere to organic rich or fine-grained material, the selected sampling locations will be depositional areas. When collecting sediment samples, care will be taken to collect fine grained material. All samples will be logged.

Surveying

Sampling locations at each site will be horizontally located using a global positioning system (GPS) following field activities. In addition, corner stakes for the three geophysical survey grids (a total of 12 points) will be located using GPS. All survey data will be tied in to the Virginia State Planar coordinate system.

Task 3: Sample Analysis and Data Validation

CDM Federal will be responsible for tracking sample analyses and obtaining results from the laboratory. The analytical data generated during the SSA field program will be validated by an independent data validation subcontractor according to EPA standard procedures.

Sample Analysis

Environmental Samples

All analyses of soil, surface water, and sediment will be conducted at a contracted laboratory that fulfills all requirements of the U.S. Navy's QA/QC Program Manual and EPA's Contract Laboratory Program. A signed certificate of analysis will be provided with each laboratory analysis, along with a certificate of compliance certifying that all work was performed in accordance with the applicable federal, state, and local regulations.

Field Quality Control Procedures

Quality control duplicate samples and blanks are used to provide a measure of the internal consistency of the samples and to provide an estimate of the components of variance and the bias in the analytical process. The types of field QC samples that will be collected are described in the Final Master QAPP (Section 10.1, Field Sampling QC Procedures). The QC samples to be collected during the SSA field sampling are summarized on Tables 4-3 and 4-4.

Data Validation

All data will be validated before the project staff interprets the data. The data validation will be performed by an independent subcontractor, and will conform to the requirements in the Final Master Work Plan, Section 5.4.3. Data that should be qualified will be flagged with the appropriate symbol. Results for QA/QC samples will be reviewed and the data will be qualified further, if necessary. Finally, the data set as a whole will be examined for consistency, anomalous results, and reasonableness.

TABLE 4-3
 Summary of Soil and Sediment Samples to be Submitted for Analysis — Site Screening Assessment

Matrix	Laboratory Parameter	Samples	Field Duplicates ¹	Field Blanks ²	Trip Blank ³	MS/MSDs ⁴	Equipment Blanks ⁵	Solids Total ⁶	Aqueous Total ⁷
Soil	TCL VOCs	20	2	1	1	1	1	23	3
	TCL SVOCs	20	2	1		1	1	23	2
	TCL Pest/PCBs	20	2	1		1	1	23	2
	TAL Inorganics and Cyanide	20	2	1		1	1	23	2
	LC-PAHs	20	2	1		1	1	23	2
	Explosives	20	2	1		1	1	23	2
Sediment	TCL VOCs	4	1	1	1	1	1	6	3
	TCL SVOCs	4	1	1		1	1	6	2
	TCL Pest/PCBs	4	1	1		1	1	6	2
	TAL Inorganics and Cyanide	4	1	1		1	1	6	2
	LC-PAHs	4	1	1		1	1	6	2
	Explosives	4	1	1		1	1	6	2
	Particle Size	4						4	
	Total Organic Carbon	4	1	1		1	1	6	2

Notes:

- 1 Field duplicates are collected at a rate of 1 per 10 samples per matrix.
- 2 Field Blanks are collected at a rate of 1 per week.
- 3 Trip Blanks are shipped at a rate of 1 per cooler for VOCs only.
- 4 Matrix Spikes/Matrix Spike Duplicates (MS/MSDs) are collected at a frequency of 1 per 20 per matrix. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses.
- 5 Equipment Blanks are shipped at a rate of 1 per day per matrix.
- 6 Solids total consists of the samples, their field duplicates, and the MS/MSDs.
- 7 Aqueous field QC samples will be analyzed by the TCL organics method (not low concentration).
 - DO = dissolve oxygen
 - PCB = polychlorinated biphenyl
 - Pest = pesticide
 - QC = quality control
 - SVOC= semivolatile organic compound
 - TAL = target analyte list
 - TCL = target compound list
 - VOC = volatile organic compounds

This table is based on Navy QA/QC requirements.

TABLE 4-4
 Summary of Aqueous Samples to be Submitted for Analysis — St. Juliens Creek Annex — Site Screening Assessment

Matrix	Laboratory Parameter	Samples	Field Duplicates ¹	Field Blanks ²	Trip Blanks ³	MS/MSDs ⁴	Equipment Blanks ⁵	Matrix Total
Surface Water	Low-concentration VOCs	4	1	1	1	1	1	9
	TCL SVOCs	4	1	1		1	1	8
	TCL Pest/PCBs	4	1	1		1	1	8
	TAL Inorganics (total) and Cyanide	4	1	1		1	1	8
	Alkalinity	4	1	1		1	1	8
	COD	4	1	1		1	1	8
	BOD	4	1	1		1	1	8
	Total Suspended Solids	4	1	1		1	1	8
	Total Dissolved Solids	4	1	1		1	1	8
	Hardness	4	1	1		1	1	8

Notes:

All environmental samples will measure water quality parameters including pH, Eh, DO, conductivity, salinity, and temperature. Field parameter samples will not be shipped for laboratory analysis.

1 Field duplicates are collected at a rate of 1 per 10 samples per matrix.

2 Field Blanks are collected at a rate of 1 per week per matrix.

3 Trip Blanks are shipped at a rate of 1 per cooler for VOCs only.

4 Matrix Spikes/Matrix Spike Duplicates (MS/MSDs) are collected at a frequency of 1 per 20 per matrix. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses.

5 Equipment Blanks are shipped at a rate of 1 per day per matrix.

DO = dissolve oxygen

PCB = polychlorinated biphenyl

Pest = pesticide

QC = quality control

SVOC= semivolatile organic compound

TAL = target analyte list

TCL = target compound list

VOC = volatile organic compounds

This table is based on Navy QA/QC requirements.

Task 4: Site Screening Assessment/Closeout Reports

This task includes evaluating the site data and generating a Draft and Final Site Screening Assessment Report. The assessment will result in the classification of each site into one of the following categories: 1) additional investigation is necessary, a removal action is required, or 3) no further action is required. The previously collected analytical data (from the RRR) and data generated under the SSA sampling and analysis program will be reviewed, and figures and tables summarizing the data will be generated. A Draft Site Screening Report will be prepared for submittal to LANTDIV. Based on evaluation of the results presented in the Draft Report, a follow-up Site Closeout report will be prepared for all no further action sites.

Draft Site Screening Assessment Report

The data evaluation for the Draft Site Screening Assessment Report will include incorporation of historical information, and analytical data from the RRR and SSA analytical data. A total of 21 sites will be evaluated. Supporting figures will be incorporated into the document to show the location of the site, sampling locations, and locations of samples exceeding screening criteria. Tables will be incorporated to present analytical results. The following is the general outline for the Draft Site Screening Assessment Report:

1. Introduction
 - 1.1 Site History
 - 1.2 Site Description
2. Field Investigation Activities
 - 2.1 Sample Collection (number and type of samples, sample designation, analyses performed)
 - 2.2 Analytical Results (including explanation of data qualifiers)
3. Risk Characterization
 - 3.1 Results of Risk-Based Screening for Human Health
 - 3.2 Ecological Risk Step 1 Problem Formulation/ Site Conceptual Models
4. Conclusions and Recommendations

The human health risk assessments are limited to developing the list of criteria to be used for screening at all the Sites and comparing measured sample concentrations to these screening values. The human health and ecological risk assessments do not include calculation of risks to potential receptors.

Human Health Risk Assessment

As part of the human health risk characterization, historical analytical data from the RRR and analytical data from this study will be evaluated. The first step in this process will be

data evaluation. All data will be examined for its usability in the risk screening. Validated data will be treated as follows prior to performing the screening:

- Estimated values flagged with a J (estimated value), K (biased high), or L (biased low) qualifier will be treated as detected concentrations
- Values qualified with an R (rejected) will not be used
- Values qualified with a B (blank contamination) will be treated as non-detects
- The higher value of duplicate samples will be used

Following the data evaluation step, data will be screened in accordance with EPA Region III's *Selection of Exposure Routes and Contaminants of Concern by Risk-Based Screening*, January 1993 guidance. The latest version of EPA Region III's RBCs will be used for screening. Consistent with EPA Region III guidance, for RBCs that are based on noncarcinogenic effects, the RBC will be divided by 10 to account for the potential for exposure to multiple contaminants. For RBCs that are based on carcinogenic effects, the RBC provided in the RBC table will be used. For groundwater, site data will be compared to the current EPA Region III RBCs for tap water. For soil, site data will be compared to the current EPA Region III RBCs for residential and industrial soil.

The screening will be documented in a table showing site data compared to screening criteria. Site concentrations which exceed screening criteria will be highlighted.

Ecological Risk Assessment

The ecological risk assessments (ERAs) will develop site conceptual models for each site but will not perform any screening of analytical data. The preliminary ecological risk characterization activities that will be completed for each of the screening sites will constitute Step 1 (Screening Problem Formulation) of the Navy/Virginia Tier II – EPA-BTAG Region III ERA workshop/guidance, which is consistent with the EPA's ERT ERA guidance and Navy ERA policy. Step 1 includes problem formulation and development of the initial conceptual model for a site. Steps completed as part of the problem formulation include:

- Describing the environmental setting;
- Listing known and suspected contaminants;
- Discussing fate and transport properties of the contaminants;
- Describing mechanisms of ecotoxicity; and
- Identifying potential exposure pathways.

Preliminary assessment endpoints will be listed as part of the exposure pathway identification. Together the problem formulation steps will generate the initial site conceptual model for each of the screening sites. No screening of analytical data will be completed as part of this report. The end result of the problem formulation will be the decision on whether there are complete exposure pathways and sufficient data to proceed

to the Step 2-Screening Risk Characterization (if needed) or whether a No Further Action determination will be made.

Final Site Screening Assessment Report

The Final Site Screening Assessment report will be prepared as part of this subtask. The Final reports address the comments received on the Draft Site Screening Assessment Report from LANTDIV, VDEQ and USEPA.

Closeout Reports

A Draft and Final Closeout report will be prepared for those sites recommended for NFA. The Draft report will include or reference applicable information on the site history, investigations, analytical and investigation results and results of the risk screening. The draft report will also include a cover sheet, a signature page (containing the site name and location, statement of basis, and declaration), and a section that will indicate that no further action is recommended for the site based on the site evaluation. A final Closeout Report will be prepared after Navy review and incorporations. Closeout reports will be prepared after the Final Site Screening Assessment Report has been approved and NFA sites have been approved for Closeout.

Staff Organization

Project Management

Project management will include overall coordination of all work to be performed at the site. The management structure for CH2MHILL is designed so that there is one central administrative point of contact, the Activity Manager, and multiple technical project managers who will manage the technical tasks as their expertise is required. The Activity Manager will maintain close contact with the LANTDIV NTR.

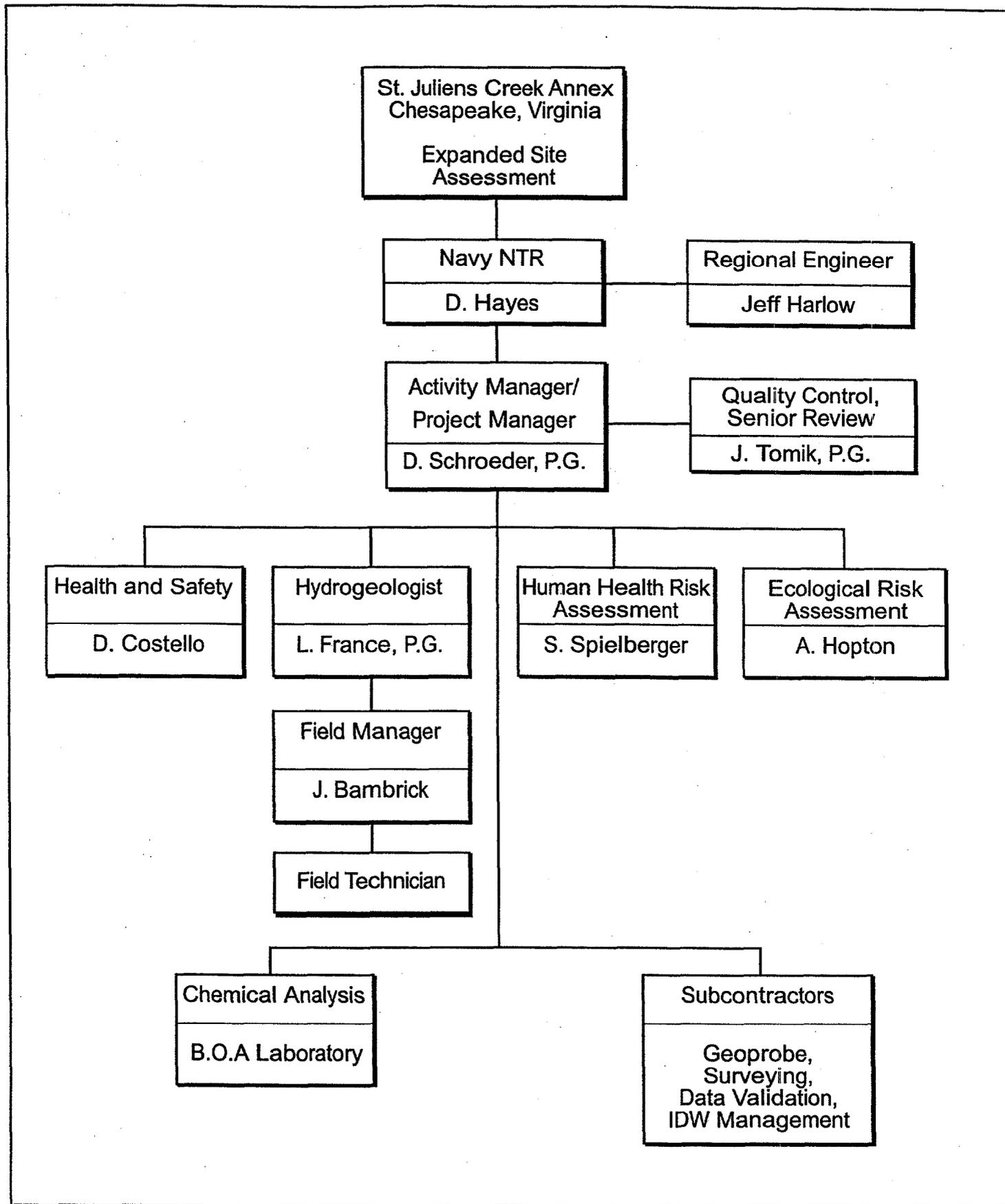
The Activity Manager will oversee and coordinate each project to maintain overall project schedule and will coordinate the monthly progress report effort. The Activity Manager will maintain routine communication with the LANTDIV NTR and provide general program support, interaction with client and regulatory agencies, and documentation of decisions on technical issues that might affect future work at the Base.

The responsibilities of the technical project managers include such activities as the preparation and submittal of Navy CLEAN daily reports, daily technical support and oversight, budget and schedule review and tracking, preparation and review of invoices, personnel-resource planning and allocation, and project-specific coordination with LANTDIV, the Activity, and subcontractors.

Project-Specific Organization

The Activity Manager, Mr. John Tomik, will be the primary point of contact for the project and will provide guidance to the Project Manager. The Project Manager, Mr. Dave Schroeder of CDM Federal, will be responsible for such activities as budget and schedule review and tracking, preparation and review of invoices, personnel-resource planning and allocation, and coordination with LANTDIV, Naval Base, Norfolk, the Annex, and subcontractors. The SSA field investigation tasks will be performed by supporting field personnel. The project organization is depicted in Figure 5-1.

CH2M HILL and CDM Federal will notify LANTDIV and the Annex about which CDM Federal personnel will mobilize to the site before initiating field activities. CDM Federal also will notify appropriate Annex personnel to acquire site access and utility clearances. The NTR, Ms. Dawn Hayes, will be advised of all site activities and schedules before site operations begin.



Section 6

Contractual Services

This section documents the anticipated subcontract services required for completing the tasks documented in this work plan. CH2M HILL will use existing BOAs with to procure subcontractors for this work. BOAs will be negotiated with new subcontractors as needed.

The SSA field and sampling program will require subcontract services from the following:

- Surface Geophysics Contractor
- IDW Subcontractor
- Analytical Laboratory
- Data Validation

Section 7

Project Schedule

This section describes the project schedule and the due dates of deliverables.

The project will be performed in accordance with the schedule and milestones presented in Figure 7-1.

**Figure 7-1
Site Screening Assessment Schedule**

Task Name	Duration	Start	Finish	Apr '00				May '00						
				4/9	4/16	4/23	4/30	5/7	5/14	5/21	5/28	6/4		
Work Plans	207 days	Mon 4/10/00	Tue 1/23/01											
Develop Draft Work Plan	17 days	Mon 4/10/00	Tue 5/2/00											
Navy, EPA, and VDEQ Review of Draft Work Plans	23 days	Tue 5/2/00	Thu 6/1/00											
Prepare Final Work Plans	10 days	Fri 10/6/00	Thu 10/19/00											
Submit Final Work Plans	1 day	Tue 1/23/01	Tue 1/23/01											
Field Investigation	32 days	Wed 12/27/00	Fri 2/9/01											
Procure Subcontractors/Mobilize	30 edays	Wed 12/27/00	Fri 1/26/01											
Conduct Field Investigation	5 days	Mon 2/5/01	Fri 2/9/01											
Data Evaluation	44 days	Mon 2/12/01	Sat 4/14/01											
Laboratory Analysis	30 edays	Mon 2/12/01	Wed 3/14/01											
Data Validation/Management	30 edays	Thu 3/15/01	Sat 4/14/01											
Reporting	77 days	Wed 3/28/01	Fri 7/13/01											
Draft Site Assessment Report	30 edays	Wed 3/28/01	Fri 4/27/01											
Navy, EPA, VDEQ Review of Draft SSA Report	28 edays	Mon 4/30/01	Mon 5/28/01											
Final Site Assessment Report	10 days	Wed 5/30/01	Tue 6/12/01											
Closeout Report	30 edays	Wed 6/13/01	Fri 7/13/01											

Project: CTO 141
Site Screening Assessment
Date: Fri 1/26/01

Task



Rolled Up Task



Project Summary



Progress



Rolled Up Milestone



Split



Milestone



Rolled Up Progress



Rolled Up Split



Summary

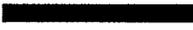


External Tasks



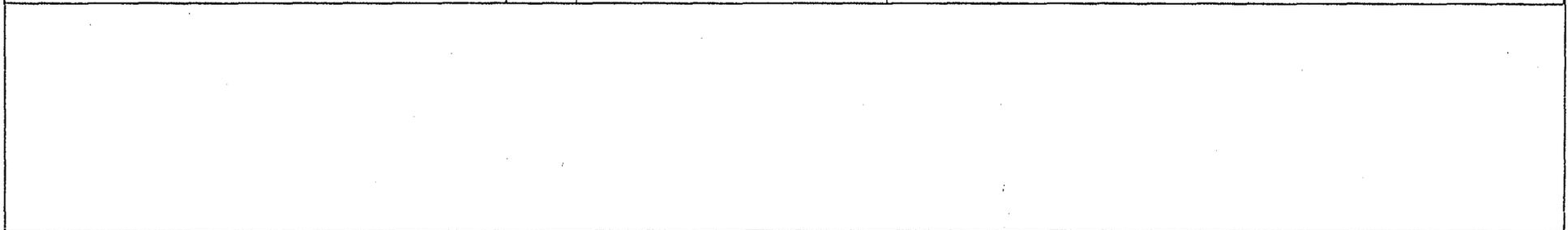
**Figure 7-1
Site Screening Assessment Schedule**

Task Name	Jun '00			Jul '00				Aug '00				Sep '00			
	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17
Work Plans															
Develop Draft Work Plan															
Navy, EPA, and VDEQ Review of Draft Work Plans															
Prepare Final Work Plans															
Submit Final Work Plans															
Field Investigation															
Procure Subcontractors/Mobilize															
Conduct Field Investigation															
Data Evaluation															
Laboratory Analysis															
Data Validation/Management															
Reporting															
Draft Site Assessment Report															
Navy, EPA, VDEQ Review of Draft SSA Report															
Final Site Assessment Report															
Closeout Report															

Project: CTO 141 Site Screening Assessment Date: Fri 1/26/01	Task		Rolled Up Task		Project Summary	
	Progress		Rolled Up Milestone		Split	
	Milestone		Rolled Up Progress		Rolled Up Split	
	Summary		External Tasks			

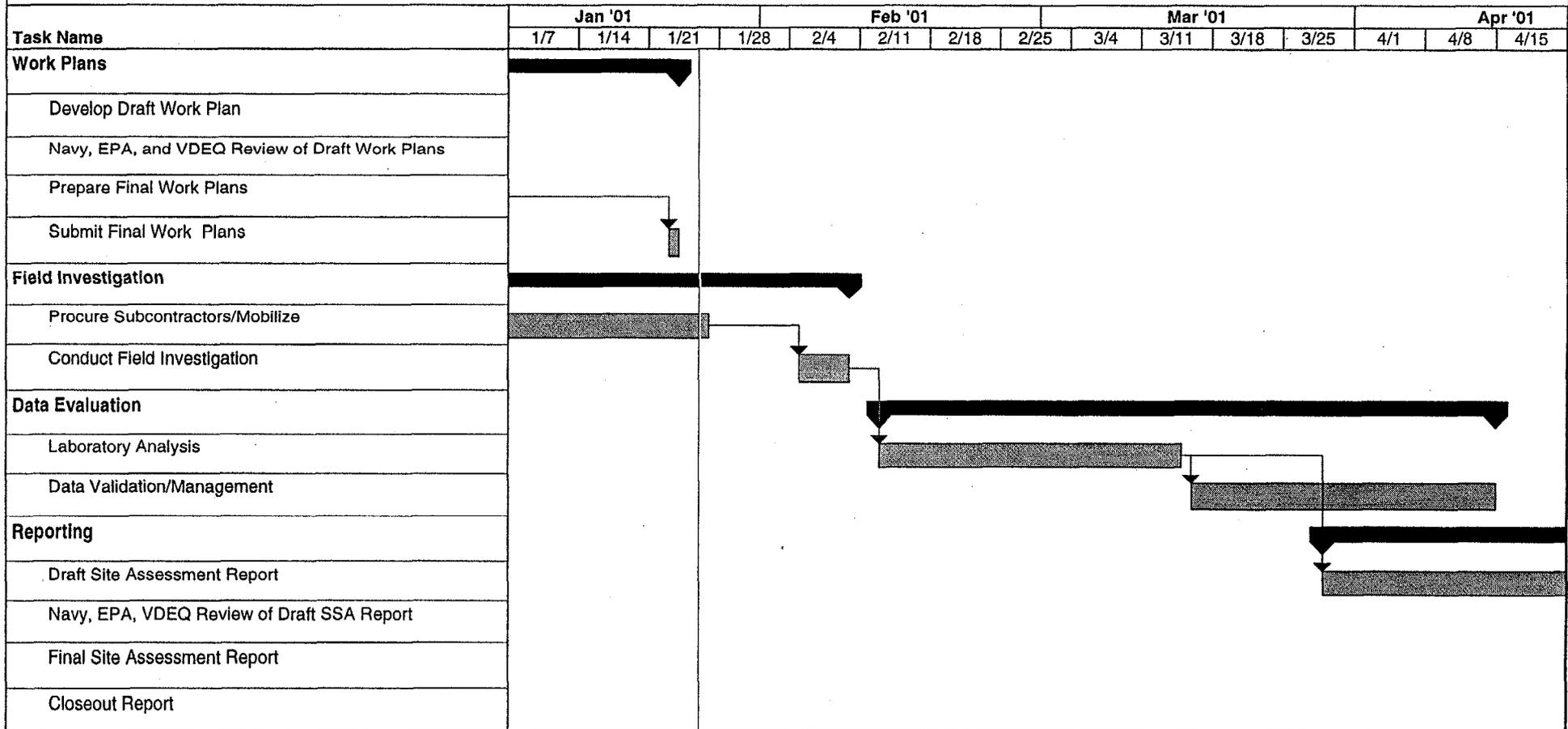
**Figure 7-1
Site Screening Assessment Schedule**

Task Name	Oct '00					Nov '00					Dec '00				
	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24	12/31
Work Plans															
Develop Draft Work Plan															
Navy, EPA, and VDEQ Review of Draft Work Plans															
Prepare Final Work Plans	██████████														
Submit Final Work Plans															
Field Investigation															
Procure Subcontractors/Mobilize															
Conduct Field Investigation															
Data Evaluation															
Laboratory Analysis															
Data Validation/Management															
Reporting															
Draft Site Assessment Report															
Navy, EPA, VDEQ Review of Draft SSA Report															
Final Site Assessment Report															
Closeout Report															



Project: CTO 141 Site Screening Assessment Date: Fri 1/26/01	Task		Rolled Up Task		Project Summary	
	Progress		Rolled Up Milestone		Split	
	Milestone		Rolled Up Progress		Rolled Up Split	
	Summary		External Tasks			

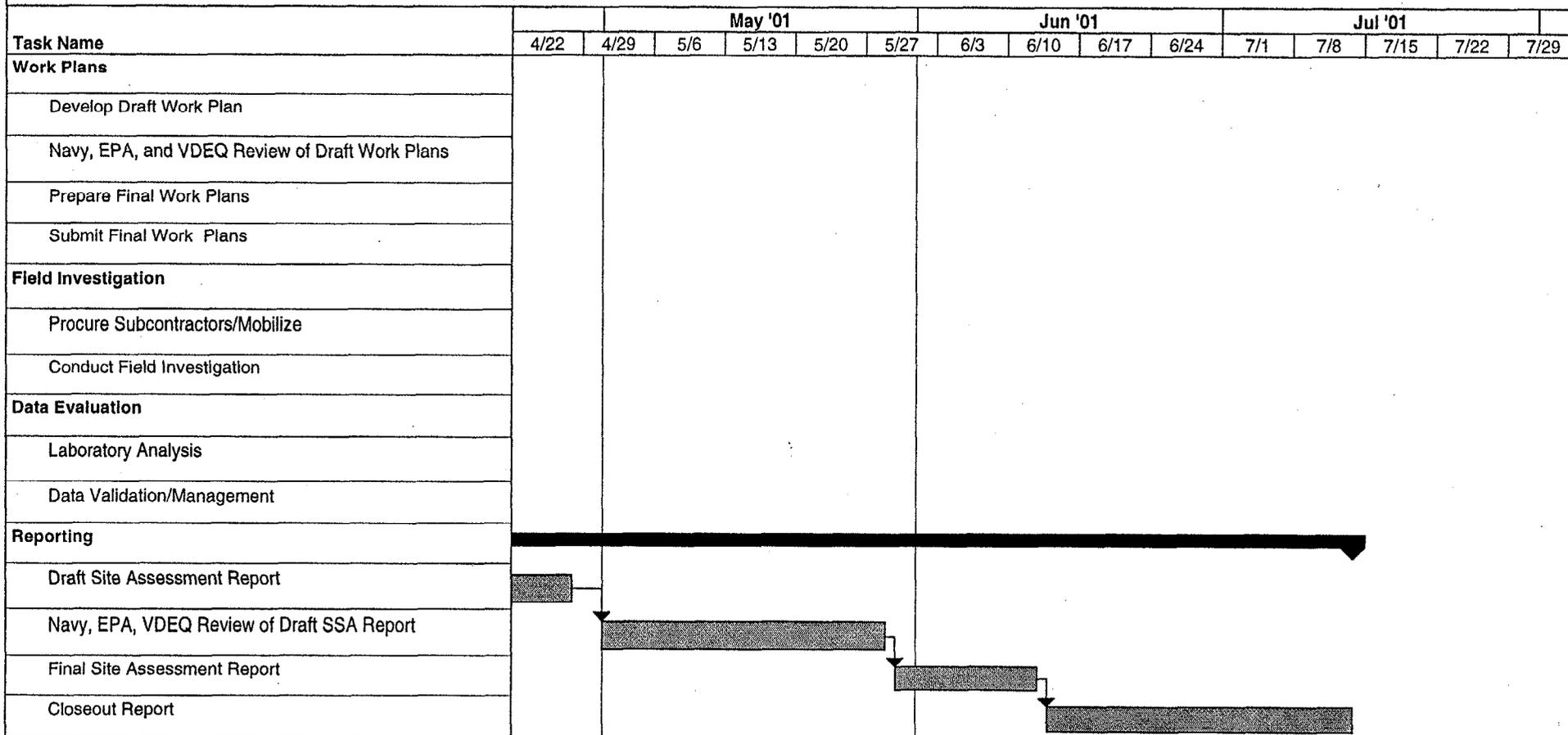
Figure 7-1
Site Screening Assessment Schedule



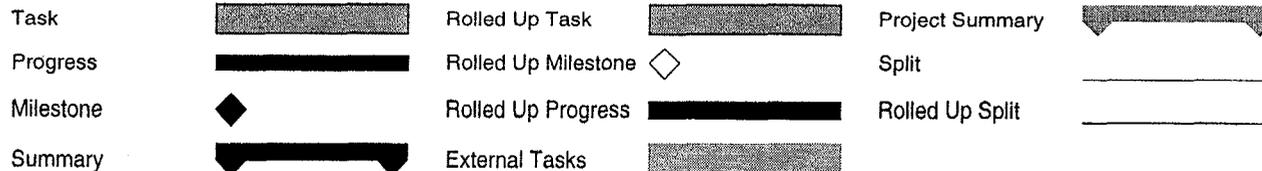
Project: CTO 141
Site Screening Assessment
Date: Fri 1/26/01

Task	[Hatched bar]	Rolled Up Task	[Hatched bar]	Project Summary	[Solid black bar with arrow]
Progress	[Solid black bar]	Rolled Up Milestone	[Diamond]	Split	[Horizontal line]
Milestone	[Diamond]	Rolled Up Progress	[Solid black bar]	Rolled Up Split	[Horizontal line]
Summary	[Solid black bar with arrow]	External Tasks	[Hatched bar]		

Figure 7-1
Site Screening Assessment Schedule



Project: CTO 141
Site Screening Assessment
Date: Fri 1/26/01



Attachment A

Site Specific Plan Checklist

Site-Specific Investigation-Derived Waste Plan Checklist For Site 1 - Landfill A

This checklist supplements the Master IDW Plan with site-specific information. Once completed for a specific project, it provides necessary IDW information for each investigation. It is to be taken into the field with the Master IDW Plan.

1. IDW Media:
 Soil cuttings
 Well development or purge water
 Decontamination wastewater
 PPE or disposable equipment
 Other _____

2. Expected Regulatory Status:
 Hazardous
 Solid Waste
 Unknown
 Other _____

3. Site Location: South site of Blows Creek east of Craddock Street.

4. Nature of Contaminants Expected: No previous sampling. No information on types of materials stored or disposed at this location.
 Petroleum contamination Herbicides
 Polyaromatic hydrocarbon PCBs
 Pesticides Metals
 Other: Will have analytical results from sediment and surface water sampling at time of IDW disposal

5. Volume of IDW Expected:
 Drum
 Cubic Yards
 Tons
 5-10 Gallons

6. Compositing Strategy for Sample Collection: One sample per drum (Composited with wastes from EPIC AOC1, EPIC AOC 8, EPIC AOC 12, and SWMU 22).

7. IDW Storage
 As per Master IDW Plan Other _____

8. Waste Disposal
 As per Master IDW Plan Other _____

Site-Specific Quality Assurance Project Plan Checklist For Site 1 –Landfill A

This checklist supplements the Master QAPP with site-specific information. Once completed for a specific project, it provides necessary quality assurance information for each investigation. It is to be taken into the field with the Master QAPP.

Site: Site 1 – Landfill A

1. List sampling tasks: Surface and subsurface soil sampling
2. List data quality objectives: High, as defined in the Master QAPP, p. 4-1. PARCC Parameters as listed in Table 4-1 of the Master QAPP.
3. Organization:

LANTDIV IR Section Head	<u>Paul A. Rakowski</u>
LANTDIV Navy Technical Representative	<u>Dawn Hayes</u>
USEPA Remedial Project Manager	<u>Todd Richardson</u>
VDEQ Federal Facilities Project Manager	<u>Devlin Harris</u>
CH2M HILL Activity Manager	<u>John Tomik</u>
CDM Federal Project Manager	<u>Dave Schroeder</u>
Quality Control Senior Review	<u>John Tomik</u>
Technical Project Manager	<u>Dave Schroeder</u>
Field Team Leader	<u>John Bambrick</u>

4. Site 1 – Landfill A. Table of samples with analyses to be performed and associated QC samples:

TABLE 1
Summary of Soil Samples to be Submitted for Analysis — St. Juliens Creek Annex Site 1 – Landfill A

Matrix	Laboratory Parameter	Samples	Field Duplicates ¹	Field Blanks ²	Trip Blank ³	MS/MSDs ⁴	Equipment Blanks ⁵	Solids Total ⁶	Aqueous Total ⁷
Surface Water SJS01SW01 SJS01SW02 SJS01SW03 SJS01SW04 SJS01SW05 and QC Samples	Low-concentration VOCs	4	1	1	1	1	1		9
	TCL SVOCs	4	1	1		1	1		8
	TCL Pest/PCBs	4	1	1		1	1		8
	TAL Inorganics (total) and Cyanide	4	1	1		1	1		8
	BOD	4	1	1		1	1		8
	COD	4	1	1		1	1		8
	Total Dissolved Solids	4	1	1		1	1		8
	Total Suspended Solids	4	1	1		1	1		8
	Cyanide	4	1	1		1	1		8
	Hardness	4	1	1		1	1		8
Sediment SJS01SD01 SJS01SD02 SJS01SD03 SJS01SD04 SJS01SD05 and QC Samples	TCL VOCs	4	1	1	2	1	1	6	4
	TCL SVOCs	4	1	1		1	1	6	2
	TCL Pest/PCBs	4	1	1		1	1	6	2
	LC-PAH	4	1	1		1	1	6	2
	TAL Inorganics and Cyanide	4	1	1		1	1	6	2
	Explosive	4	1	1		1	1	6	2
	Soil Classification	4						4	
	Total Organic Carbon	4	1	1		1	1	6	2

Notes:

- Field duplicates are collected at a rate of 1 per 10 samples per matrix. Number of duplicates will be based on the total number of SSA surface and Subsurface soil samples.
- Field Blanks are collected at a rate of 1 per week per matrix. Number of field blanks will be based on the total number of SSA surface and Subsurface soil samples
- Trip Blanks are shipped at a rate of 1 per cooler for VOCs only.
- Matrix Spikes/Matrix Spike Duplicates (MS/MSDs) are collected at a frequency of 1 per 20 per matrix. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses.
- Equipment Blanks are shipped at a rate of 1 per day per matrix. Number of equipment will be based on the total number of SSA surface and Subsurface soil samples
- Solids total consists of the samples, their field duplicates, and the MS/MSDs.
- Aqueous field QC samples will be analyzed by the TCL organics method (not low concentration).

DO = dissolve oxygen
PCB = polychlorinated biphenyl
Pest = pesticide
QC = quality control

SVOC= semivolatile organic compound
TAL = target analyte list
TCL = target compound list
VOC = volatile organic compounds

LC-PAH = Low Concentration Polynuclear aromatic hydrocarbon

This table is based on Navy QA/QC requirements.

5. Analytical Quantitation Limits:
 As per Table 8-2 of Master QAPP (LC-PAH) Other (attached)
6. QA/QC Acceptance Criteria (e.g., precision, accuracy)
 As per Table 4-1 of Master QAPP Other (attached)
7. Data reduction, validation, and reporting:
 As per Section 9 of Master QAPP Other (attached)
8. Internal QC Procedures (field and laboratory):
 As per Section 10 of Master QAPP Other (attached)
9. Corrective Action:
 As per Section 14 of Master QAPP Other (attached)
10. Other deviations from Master QAPP _____

5. (Cont.) Low Concentration Polynuclear Aromatic Hydrocarbons Analytical Quantitation Limits

Analyte	ug/kg	Analyte	ug/kg
Naphthalene	75	Chyresene	75
Aenaphthylene	75	Benzo(b)fluoranthene	75
Fluorene	75	Benzo(k)fluoranthene	75
Phenanthrene	75	Benzo (a) pyrene	75
Anthracene	75	Indeno (1,2,3-cd) pyrene	75
Fluoranthene	75	Bibenz(a,h,) anthracene	75
Pyrene	75	Benzo (g,h,i) perylene	75
Benzo (a) anthracene	75	Acenaphthene	75

Site-Specific Field Sampling Plan Checklist For Site 1 – Landfill A

This checklist supplements the Master Field Sampling Plan with site-specific information. Once completed for a specific project, it provides necessary field sampling information for each investigation. It is to be taken into the field with the Master FSP.

Site: Site 1- Landfill A

1. Tasks to be performed:

- Geophysical surveys
- Soil gas surveys
- Surface water and sediment sampling
- Surface soil sampling
- Soil boring installation
- Subsurface soil sampling
- Monitoring well installation and development
- Monitoring well abandonment
- Groundwater sampling
- In-situ groundwater sampling
- Aquifer testing
- Hydrogeologic measurements
- Biota sampling
- Trenching
- Land surveying (GPS)
- Investigation derived waste sampling
- Decontamination
- Other _____

2. Field measurements to be taken:

- temperature
- pH (sediment and Surface water)
- dissolved oxygen
- turbidity
- specific conductance
- organic vapor monitoring
- electromagnetic induction
- ground-penetrating radar
- surveying
- magnetometry
- global positioning system
- soil gas parameters (list):
- combustibile gases
- water-level measurements
- pumping rate
- other Eh (sediment)

3. Sampling program (nomenclature, etc.):
 As per Section 3.1 of Master FSP Other _____
4. Map of boring and sampling locations (See Figure 4-7):
5. Table of field samples to be collected: (See Table 1 in Site Specific QAPP Checklist)
6. Applicable SOPs - pages in Master FSP:
- Surface Water Sampling – page 5.1-1**
 - Sediment Sampling – page 5.2-1**
 - Field Rinse Blank Preparation - page 9.3-1**
 - Homogenization of Soil and Sediment Samples – page 9.5-1**
 - Packaging and Shipping Procedures – page 9.6-1**
 - Chain of Custody – page 9.7-1**
 - Decontamination of Personnel and Equipment – page 10.2-1**
7. Site-specific procedures or updates to protocols established in the Master FSP:

Site-Specific Health and Safety Plan for Site 1 - Landfill A

This checklist must be used in conjunction with the Master HASP. This checklist is intended for use by CDM Federal and CH2M HILL employees only. All CDM Federal and CH2M HILL employees performing tasks under this checklist must read and sign both this checklist and the Master HASP and agree to abide by their provisions (see EMPLOYEE SIGNOFF attached to the checklist).

Site: Site 1 - Landfill A

Location(s) See Figure 3-1

This document shall be maintained on site with the Master Health and Safety Plan. It will include as attachments from the Work Plan a site map and the site characterization and objectives for this site.

The procedures described in the Master Health and Safety Plan will be followed unless otherwise specified in this Site-Specific Health and Safety Plan.

1. HAZWOPER-Regulated Tasks

- Test pit and excavation
- Soil boring installation
- Geoprobe boring
- Geophysical surveys
- Hand augering
- Subsurface soil sampling
- Surface soil sampling
- Soil gas surveys
- Sediment sampling
- Monitoring well/drive point installation
- Monitoring well abandonment
- Groundwater sampling
- Aquifer testing
- Hydrologic measurements
- Surface water sampling
- Biota sampling
- Investigation-derived waste (drum) sampling and disposal
- Observation of loading of material for offsite disposal
- Oversight of remediation and construction
- Other _____

2. Hazards of Concern:

- Heat stress
- Cold stress
- Buried utilities, drums, tanks
- Inadequate illumination
- Drilling
- Heavy equipment
- Working near water
- Flying debris
- Gas cylinders
- Noise
- Slip, trip, or fall hazards
- Back injury
- Confined space entry
- Trenches, excavations
- Protruding objects
- Vehicle traffic
- Ladders, scaffolds
- Fire
- Working on water
- Snakes or insects
- Poison ivy, oak, sumac
- Ticks
- Radiological
- Other _____

3. Contaminants of Concern.

<u>PAHs</u>	<u>Nitrobenzene</u>	_____
<u>DDT, DDE</u>	_____	_____

4. Personnel

Field team leader(s)	John Bambrick	703-968-0900
Site safety coordinator(s)	John Bambrick	703-968-0900
Field team members	Lynne France	
	Dave Michailof	

5. Contractors/Subcontractors

X _____ Procedures as per Master HASP

_____ Other _____

Name: _____

Contact: _____

Telephone: _____

6. Level of personal protective equipment (PPE) required: Level D
Refer to Table 5.1 of Master HASP, SOPs, and Respiratory Protection, Section 2 of the Site Safety Notebook.

7. Air monitoring instruments to be used:

X _____ PID _____ FID
_____ CGI _____ Dust monitor
_____ O₂

8. Decontamination procedures:

X _____ As per Section 7 of Master HASP
_____ Other _____

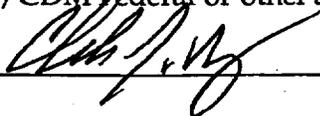
9. List any other deviations or variations from the Master HASP:

10. Emergency Response: (See Sections 11 and 12 in the Master HASP and summary of Contingency Plans in Attachment B, Emergency Contacts)

11. Map to Hospital: (See Attachment B)

-12. Emergency Contacts: (See Attachment B)

13. Approval. This prepared site-specific checklist must be approved by Mr. Chuck Myers/CDM Federal or other authorized representative

Name  Title Mgr. H&S Date 11/29/01

14. Employee Signoff. All CDM Federal and CH2M HILL employees working at the site must sign the attached Employee Signoff for the checklist as well as for the Master HASP.

Site-Specific Investigation-Derived Waste Plan Checklist For EPIC AOC 1

This checklist supplements the Master IDW Plan with site-specific information. Once completed for a specific project, it provides necessary IDW information for each investigation. It is to be taken into the field with the Master IDW Plan.

1. IDW Media:
 - Soil cuttings
 - Well development or purge water
 - Decontamination wastewater
 - PPE or disposable equipment

2. Expected Regulatory Status:
 - Hazardous
 - Solid Waste
 - Unknown
 - Other _____

3. Site Location: This site is located at the intersection of E Street and Marsh Road, south of Building 181 and 182. The site extends across Marsh Road, adjacent to the Blows Creek.

4. Nature of Contaminants Expected:

<input type="checkbox"/> Petroleum contamination	<input type="checkbox"/> Herbicides
<input type="checkbox"/> Polyaromatic hydrocarbon	<input type="checkbox"/> PCBs
<input type="checkbox"/> Pesticides	<input type="checkbox"/> Metals
<input type="checkbox"/> Other: <u>Will have analytical results from soil sampling at time of IDW disposal</u>	

5. Volume of IDW Expected:
 - Drum
 - Cubic Yards
 - Tons
 - 5-10 Gallons

6. Compositing Strategy for Sample Collection: One sample per drum (Composited with wastes from EPIC AOC8, EPIC AOC 12, SWMU 22 and IR Site 1).

7. IDW Storage
 - As per Master IDW Plan
 - Other _____

8. Waste Disposal
 - As per Master IDW Plan
 - Other _____

Site-Specific Quality Assurance Project Plan Checklist For EPIC AOC 1

This checklist supplements the Master QAPP with site-specific information. Once completed for a specific project, it provides necessary quality assurance information for each investigation. It is to be taken into the field with the Master QAPP.

Site: EPIC AOC 1

1. List sampling tasks: Surface and subsurface soil sampling
2. List data quality objectives: High, as defined in the Master QAPP, p. 4-1. PARCC Parameters as listed in Table 4-1 of the Master QAPP.
3. Organization:

LANTDIV IR Section Head	<u>Paul A. Rakowski</u>
LANTDIV Navy Technical Representative	<u>Dawn Hayes</u>
USEPA Remedial Project Manager	<u>Todd Richardson</u>
VDEQ Federal Facilities Project Manager	<u>Devlin Harris</u>
CH2M HILL Activity Manager	<u>John Tomik</u>
CDM Federal Project Manager	<u>Dave Schroeder</u>
Quality Control Senior Review	<u>John Tomik</u>
Technical Project Manager	<u>Dave Schroeder</u>
Field Team Leader	<u>John Bambrick</u>

4. EPIC AOC – 1. Table of samples with analyses to be performed and associated QC samples:

TABLE 1
Summary of Soil Samples to be Submitted for Analysis — St. Juliens Creek Annex – AOC 1

Samples	Laboratory Parameter	Samples	Field Duplicates ¹	Field Blanks ²	Trip Blank ³	MS/MSDs ⁴	Equipment Blanks ⁵	Solids Total ⁶	Aqueous Total ⁷
Surface Soil: SJA01SS0100 SJA01SS0200 SJA01SS0300 SJA01SS0400 and QC samples	TCL VOCs	4	1	1	1	1	1	6	4
	TCL SVOCs	4	1	1		1	1	6	3
	TCL Pest/PCBs	4	1	1		1	1	6	3
	TAL Inorganics and Cyanide	4	1	1		1	1	6	3
	Explosives	4	1	1		1	1	6	3
	LC-PAHs	4	1	1		1	1	6	2
Subsurface Soil SJA01SB0103 SJA01SB0203 SJA01SB0303 SJA01SB0403 and QC samples	TCL VOCs	4	1	1	1	1	1	6	4
	TCL SVOCs	4	1	1		1	1	6	3
	TCL Pest/PCBs	4	1	1		1	1	6	3
	TAL Inorganics and Cyanide	4	1	1		1	1	6	3
	Explosives	4	1	1		1	1	6	3
	LCPAHs	4	1	1		1	1	6	2

Notes:

- 1 Field duplicates are collected at a rate of 1 per 10 samples per matrix. Number of duplicates will be based on the total number of SSA surface and Subsurface soil samples
- 2 Field Blanks are collected at a rate of 1 per week per matrix. Number of Filed Blanks will be based on the total number of samples , per matrix, for the SSA investigation.
- 3 Trip Blanks are shipped at a rate of 1 per cooler for VOCs only.
- 4 Matrix Spikes/Matrix Spike Duplicates (MS/MSDs) are collected at a frequency of 1 per 20 per matrix. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses.
- 5 Equipment Blanks are shipped at a rate of 1 per day per matrix. Number of equipment blanks will be based on the total number of SSA surface and Subsurface soil samples

6 Solids total consists of the samples, their field duplicates, and the MS/MSDs.

7 Aqueous field QC samples will be analyzed by the TCL organics method (not low concentration).

SVOC= semivolatile organic compound

PCB = polychlorinated biphenyl

Pest = pesticide

QC = quality control

TAL = target analyte list

TCL = target compound list

VOC = volatile organic compounds

LC-PAH = Low Concentration Polynuclear Aromatic Hydrocarbons

This table is based on Navy QA/QC requirements.

5. Analytical Quantitation Limits:
 As per Table 8-2 of Master QAPP (LC-PAH) Other (attached)
6. QA/QC Acceptance Criteria (e.g., precision, accuracy)
 As per Table 4-1 of Master QAPP Other (attached)
7. Data reduction, validation, and reporting:
 As per Section 9 of Master QAPP Other (attached)
8. Internal QC Procedures (field and laboratory):
 As per Section 10 of Master QAPP Other (attached)
9. Corrective Action:
 As per Section 14 of Master QAPP Other (attached)
10. Other deviations from Master QAPP _____

5. (Cont.) Low Concentration Polynuclear Aromatic Hydrocarbons Analytical Quantitation Limits

Analyte	ug/kg	Analyte	ug/kg
Naphthalene	75	Chyresene	75
Aenaphthylene	75	Benzo(b)fluoranthene	75
Fluorene	75	Benzo(k)fluoranthene	75
Phenanthrene	75	Benzo (a) pyrene	75
Anthracene	75	Indeno (1,2,3-cd) pyrene	75
Fluoranthene	75	Bibenz(a,h,) anthracene	75
Pyrene	75	Benzo (g,h,i) perylene	75
Benzo (a) anthracene	75	Acenaphthene	75

Site-Specific Field Sampling Plan Checklist For EPIC AOC 1

This checklist supplements the Master Field Sampling Plan with site-specific information. Once completed for a specific project, it provides necessary field sampling information for each investigation. It is to be taken into the field with the Master FSP.

Site: EPIC AOC1

1. Tasks to be performed:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Geophysical surveys | <input type="checkbox"/> Groundwater sampling |
| <input type="checkbox"/> Soil gas surveys | <input type="checkbox"/> In-situ groundwater sampling |
| <input type="checkbox"/> Surface water and sediment sampling | <input type="checkbox"/> Aquifer testing |
| <input checked="" type="checkbox"/> Surface soil sampling | <input type="checkbox"/> Hydrogeologic measurements |
| <input type="checkbox"/> Soil boring installation | <input type="checkbox"/> Biota sampling |
| <input checked="" type="checkbox"/> Subsurface soil sampling | <input type="checkbox"/> Trenching |
| <input type="checkbox"/> Monitoring well installation and development | <input checked="" type="checkbox"/> Land surveying (GPS) |
| <input type="checkbox"/> Monitoring well abandonment | <input type="checkbox"/> Investigation derived waste sampling |
| | <input checked="" type="checkbox"/> Decontamination |
| | <input type="checkbox"/> Other _____ |

2. Field measurements to be taken:

- | | |
|--|---|
| <input type="checkbox"/> temperature | <input type="checkbox"/> surveying |
| <input type="checkbox"/> pH | <input type="checkbox"/> magnetometry |
| <input type="checkbox"/> dissolved oxygen | <input checked="" type="checkbox"/> global positioning system |
| <input type="checkbox"/> turbidity | <input type="checkbox"/> soil gas parameters (list): |
| <input type="checkbox"/> specific conductance | <input type="checkbox"/> combustible gases |
| <input type="checkbox"/> organic vapor monitoring | <input type="checkbox"/> water-level measurements |
| <input type="checkbox"/> geophysical parameters (list): | <input type="checkbox"/> pumping rate |
| <input type="checkbox"/> electromagnetic induction | <input type="checkbox"/> other _____ |
| <input checked="" type="checkbox"/> ground-penetrating radar | |

3. Sampling program (nomenclature, etc.):

- | | |
|--|--|
| <input checked="" type="checkbox"/> As per Section 3.1 of Master FSP
<u>this site will be A01</u> | <input checked="" type="checkbox"/> Other Note: <u>The Site Number for</u> |
|--|--|

4. Maps of geophysical survey and sampling locations: (See Figure 4-1 and 4-4)

5. Table of field samples to be collected: (See Site Specific QAPP Checklist)

6. Applicable SOPs - pages in Master FSP:

Soil Sampling – page 4.1-1

Ground Penetrating Radar – page 8.2-1

Field Rinse Blank Preparation - page 9.3-1

Homogenization of Soil and Sediment Samples – page 9.5-1

Packaging and Shipping Procedures – page 9.6-1

Chain of Custody – page 9.7-1

Decontamination of Personnel and Equipment – page 10.2-1

7. **Site-specific procedures or updates to protocols established in the Master FSP:**
-

Site-Specific Health and Safety Plan for EPIC AOC 1

This checklist must be used in conjunction with the Master HASP. This checklist is intended for use by CDM Federal and CH2M HILL employees only. All CDM Federal and CH2M HILL employees performing tasks under this checklist must read and sign both this checklist and the Master HASP and agree to abide by their provisions (see EMPLOYEE SIGNOFF attached to the checklist).

Site: EPICAOC 1

Location(s) See Figure 3-7

This document shall be maintained on site with the Master Health and Safety Plan. It will include as attachments from the Work Plan a site map and the site characterization and objectives for this site.

The procedures described in the Master Health and Safety Plan will be followed unless otherwise specified in this Site-Specific Health and Safety Plan.

1. HAZWOPER-Regulated Tasks

- | | |
|---|---|
| <input type="checkbox"/> Test pit and excavation | <input type="checkbox"/> Groundwater sampling |
| <input type="checkbox"/> Soil boring installation | <input type="checkbox"/> Aquifer testing |
| <input type="checkbox"/> Geoprobe boring | <input type="checkbox"/> Hydrologic measurements |
| <input checked="" type="checkbox"/> Geophysical surveys | <input type="checkbox"/> Surface water sampling |
| <input checked="" type="checkbox"/> Hand augering | <input type="checkbox"/> Biota sampling |
| <input checked="" type="checkbox"/> Subsurface soil sampling | <input type="checkbox"/> Investigation-derived waste (drum) sampling and disposal |
| <input checked="" type="checkbox"/> Surface soil sampling | <input checked="" type="checkbox"/> Observation of loading of material for offsite disposal |
| <input type="checkbox"/> Soil gas surveys | <input type="checkbox"/> Oversight of remediation and construction |
| <input type="checkbox"/> Sediment sampling | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Monitoring well/drive point installation | |
| <input type="checkbox"/> Monitoring well abandonment | |

2. Hazards of Concern:

- | | |
|--|---|
| <input type="checkbox"/> Heat stress | <input type="checkbox"/> Confined space entry |
| <input checked="" type="checkbox"/> Cold stress | <input type="checkbox"/> Trenches, excavations |
| <input checked="" type="checkbox"/> Buried utilities, drums, tanks | <input type="checkbox"/> Protruding objects |
| <input type="checkbox"/> Inadequate illumination | <input type="checkbox"/> Vehicle traffic |
| <input type="checkbox"/> Drilling | <input type="checkbox"/> Ladders, scaffolds |
| <input type="checkbox"/> Heavy equipment | <input type="checkbox"/> Fire |
| <input type="checkbox"/> Working near water | <input type="checkbox"/> Working on water |
| <input type="checkbox"/> Flying debris | <input checked="" type="checkbox"/> Snakes or insects |
| <input type="checkbox"/> Gas cylinders | <input type="checkbox"/> Poison ivy, oak, sumac |
| <input checked="" type="checkbox"/> Noise | <input checked="" type="checkbox"/> Ticks |
| <input type="checkbox"/> Slip, trip, or fall hazards | <input type="checkbox"/> Radiological |
| <input type="checkbox"/> Back injury | <input type="checkbox"/> Other _____ |

9. List any other deviations or variations from the Master HASP:
10. Emergency Response: (See Sections 11 and 12 in the Master HASP and summary of Contingency Plans in Attachment B, Emergency Contacts)
11. Map to hospital: (See Attachment B)
12. Emergency Contacts: (See Attachment B)

13. Approval. This prepared site-specific checklist must be approved by Mr. Chuck Myers/CDM Federal or other authorized representative

Name Chuck J. Myers Title Mgr. HHS Date 1/29/01

14. Employee Signoff. All CDM Federal and CH2M HILL employees working at the site must sign the attached Employee Signoff for the checklist as well as for the Master HASP.

Site-Specific Investigation-Derived Waste Plan Checklist For EPIC AOC 8

This checklist supplements the Master IDW Plan with site-specific information. Once completed for a specific project, it provides necessary IDW information for each investigation. It is to be taken into the field with the Master IDW Plan.

1. IDW Media:
 - Soil cuttings
 - Well development or purge water
 - Decontamination wastewater
 - PPE or disposable equipment

2. Expected Regulatory Status:
 - Hazardous
 - Solid Waste
 - Unknown
 - Other _____

3. Site Location: Adjacent and north of Building 176.

4. Nature of Contaminants Expected: No previous sampling. No information on types of materials stored or disposed at this location.
 - Petroleum contamination Herbicides
 - Polyaromatic hydrocarbon PCBs
 - Pesticides Metals
 - Other Will have analytical results from soil sampling at time of IDW disposal

5. Volume of IDW Expected:
 - Drum
 - Cubic Yards
 - Tons
 - 5-10 Gallons

6. Compositing Strategy for Sample Collection: One sample per drum (Composited with wastes from EPIC AOC1, EPIC AOC 12, SWMU 22 and IRP Site 1).

7. IDW Storage
 - As per Master IDW Plan Other _____

8. Waste Disposal
 - As per Master IDW Plan Other _____

Site-Specific Quality Assurance Project Plan Checklist For EPIC AOC 8

This checklist supplements the Master QAPP with site-specific information. Once completed for a specific project, it provides necessary quality assurance information for each investigation. It is to be taken into the field with the Master QAPP.

Site: EPIC AOC 8

1. List sampling tasks: Surface and subsurface soil sampling
2. List data quality objectives: **High**, as defined in the Master QAPP, p. 4-1. PARCC Parameters as listed in Table 4-1 of the Master QAPP.

3. Organization:

LANTDIV IR Section Head	<u>Paul A. Rakowski</u>
LANTDIV Navy Technical Representative	<u>Dawn Hayes</u>
USEPA Remedial Project Manager	<u>Todd Richardson</u>
VDEQ Federal Facilities Project Manager	<u>Devlin Harris</u>
CH2M HILL Activity Manager	<u>John Tomik</u>
CDM Federal Project Manager	<u>Dave Schroeder</u>
Quality Control Senior Review	<u>John Tomik</u>
Technical Project Manager	<u>Dave Schroeder</u>
Field Team Leader	<u>John Bambrick</u>

4. EPIC AOC – 8. Table of samples with analyses to be performed and associated QC samples:

TABLE 1
Summary of Soil Samples to be Submitted for Analysis — St. Juliens Creek Annex – AOC 8

Samples	Laboratory Parameter	Samples	Field Duplicates ¹	Field Blanks ²	Trip Blank ³	MS/MSDs ⁴	Equipment Blanks ⁵	Solids Total ⁶	Aqueous Total ⁷
Surface Soil: SJA08SS0100 SJA08SS0200 SJA08SS0300 and QC samples	TCL VOCs	3	1		1	1		4	4
	TCL SVOCs	3	1			1		4	
	TCL Pest/PCBs	3	1			1		4	
	TAL Inorganics and Cyanide	3	1			1		4	
	Explosives	3	1			1		4	
	LC-PAH	3	1			1		4	
Subsurface Soil SJA08SB0103 SJA08SB0203 SJA08SB0303 and QC samples	TCL VOCs	3	1		1	1		4	4
	TCL SVOCs	3	1			1		4	
	TCL Pest/PCBs	3	1			1		4	
	TAL Inorganics and Cyanide	3	1			1		4	
	Explosives	3	1			1		4	
	LC-PAH	3	1			1		4	

Notes:

- 1 Field duplicates are collected at a rate of 1 per 10 samples per matrix. Number of duplicates will be based on the total number of SSA surface and Subsurface soil samples
- 2 Field Blanks are collected at a rate of 1 per week per matrix. Number of Filed Blanks will be based on the total number of samples , per matrix, for the SSA investigation.
- 3 Trip Blanks are shipped at a rate of 1 per cooler for VOCs only.
- 4 Matrix Spikes/Matrix Spike Duplicates (MS/MSDs) are collected at a frequency of 1 per 20 per matrix. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses.
- 5 Equipment Blanks are shipped at a rate of 1 per day per matrix. Number of equipment blanks will be based on the total number of SSA surface and Subsurface soil samples
- 6 Solids total consists of the samples, their field duplicates, and the MS/MSDs.
- 7 Aqueous field QC samples will be analyzed by the TCL organics method (not low concentration).

SVOC= semivolatile organic compound

PCB = polychlorinated biphenyl

Pest = pesticide

QC = quality control

TAL = target analyte list

TCL = target compound list

VOC = volatile organic compounds

LC-PAH = Low Concentration Polynuclear aromatic hydrocarbons

This table is based on Navy QA/QC requirements.

5. Analytical Quantitation Limits:
 As per Table 8-2 of Master QAPP (LC-PAH) Other (attached)
6. QA/QC Acceptance Criteria (e.g., precision, accuracy)
 As per Table 4-1 of Master QAPP _____ Other (attached)
7. Data reduction, validation, and reporting:
 As per Section 9 of Master QAPP _____ Other (attached)
8. Internal QC Procedures (field and laboratory):
 As per Section 10 of Master QAPP _____ Other (attached)
9. Corrective Action:
 As per Section 14 of Master QAPP _____ Other (attached)
10. Other deviations from Master QAPP _____

5. (Cont.) Low Concentration Polynuclear Aromatic Hydrocarbons Analytical Quantitation Limits

Analyte	ug/kg	Analyte	ug/kg
Naphthalene	75	Chyresene	75
Aenaphthylene	75	Benzo(b)fluoranthene	75
Fluorene	75	Benzo(k)fluoranthene	75
Phenanthrene	75	Benzo (a) pyrene	75
Anthracene	75	Indeno (1,2,3-cd) pyrene	75
Fluoranthene	75	Bibenz(a,h,) anthracene	75
Pyrene	75	Benzo (g,h,i) perylene	75
Benzo (a) anthracene	75	Acenaphthene	75

Site-Specific Field Sampling Plan Checklist For EPIC AOC 8

This checklist supplements the Master Field Sampling Plan with site-specific information. Once completed for a specific project, it provides necessary field sampling information for each investigation. It is to be taken into the field with the Master FSP.

Site: EPIC AOC8

1. Tasks to be performed:

- Geophysical surveys
- Soil gas surveys
- Surface water and sediment sampling
- Surface soil sampling
- Soil boring installation
- Subsurface soil sampling
- Monitoring well installation and development
- Monitoring well abandonment
- Groundwater sampling
- In-situ groundwater sampling
- Aquifer testing
- Hydrogeologic measurements
- Biota sampling
- Trenching
- Land surveying (GPS)
- Investigation derived waste sampling
- Decontamination
- Other _____

2. Field measurements to be taken:

- temperature
- pH
- dissolved oxygen
- turbidity
- specific conductance
- organic vapor monitoring
- electromagnetic induction
- ground-penetrating radar
- surveying
- magnetometry
- global positioning system
- soil gas parameters (list):
- combustible gases
- water-level measurements

3. Sampling program (nomenclature, etc.):
 As per Section 3.1 of Master FSP Other Note: The Site Number for this site will be A08
4. Maps of geophysical surveys and sampling locations: (See Figures 4-2 and 4-5)
5. Table of field samples to be collected: (See Table in Site Specific QAPP Checklist)
6. Applicable SOPs - pages in Master FSP:
- Soil Sampling – page 4.1-1**
 - Electromagnetic Induction – page 8.3-1**
 - Field Rinse Blank Preparation - page 9.3-1**
 - Homogenization of Soil and Sediment Samples – page 9.5-1**
 - Packaging and Shipping Procedures – page 9.6-1**
 - Chain of Custody – page 9.7-1**
 - Decontamination of Personnel and Equipment – page 10.2-1**
7. Site-specific procedures or updates to protocols established in the Master FSP:

Site-Specific Health and Safety Plan for EPIC AOC 8

This checklist must be used in conjunction with the Master HASP. This checklist is intended for use by CDM Federal and CH2M HILL employees only. All CDM Federal and CH2M HILL employees performing tasks under this checklist must read and sign both this checklist and the Master HASP and agree to abide by their provisions (see EMPLOYEE SIGNOFF attached to the checklist).

Site: EPICAOC 8

Location(s) See Figure 3-8

This document shall be maintained on site with the Master Health and Safety Plan. It will include as attachments from the Work Plan a site map and the site characterization and objectives for this site.

The procedures described in the Master Health and Safety Plan will be followed unless otherwise specified in this Site-Specific Health and Safety Plan.

1. HAZWOPER-Regulated Tasks

- Test pit and excavation
- Soil boring installation
- Geoprobe boring
- Geophysical surveys
- Hand augering
- Subsurface soil sampling
- Surface soil sampling
- Soil gas surveys
- Sediment sampling
- Monitoring well/drive point installation
- Monitoring well abandonment
- Groundwater sampling
- Aquifer testing
- Hydrologic measurements
- Surface water sampling
- Biota sampling
- Investigation-derived waste (drum) sampling and disposal
- Observation of loading of material for offsite disposal
- Oversight of remediation and construction
- Other _____

2. Hazards of Concern:

- Heat stress
- Cold stress
- Buried utilities, drums, tanks
- Inadequate illumination
- Drilling
- Heavy equipment
- Working near water
- Flying debris
- Gas cylinders
- Noise
- Slip, trip, or fall hazards
- Back injury
- Confined space entry
- Trenches, excavations
- Protruding objects
- Vehicle traffic
- Ladders, scaffolds
- Fire
- Working on water
- Snakes or insects
- Poison ivy, oak, sumac
- Ticks
- Radiological
- Other _____

3. Contaminants of Concern:

Unknown

4. Personnel:

Field team leader(s)	John Bambrick	703-968-0900
Site safety coordinator(s)	John Bambrick	703-968-0900
Field team members	Lynne France	
	Dave Michailof	

5. Contractors/Subcontractors

Procedures as per Master HASP

Other _____

Name: _____

Contact: _____

Telephone: _____

6. Level of personal protective equipment (PPE) required: Level D
Refer to Table 5.1 of Master HASP, SOPs, and Respiratory Protection, Section 2 of the Site Safety Notebook.

7. Air monitoring instruments to be used:

PID FID O₂
 CGI Dust monitor

8. Decontamination procedures:

As per Section 7 of Master HASP
 Other _____

9. List any other deviations or variations from the Master HASP:

10. Emergency Response: (See Sections 11 and 12 in the Master HASP and summary of Contingency Plans in Attachment B, Emergency Contacts)

11. Map to hospital (See Attachment B)

12. Emergency Contacts (See Attachment B)

13. Approval. This prepared site-specific checklist must be approved by Mr. Chuck Myers/CDM Federal or other authorized representative

Name Chuck J. Myers Title Mgr. H&S Date 1/29/01

14. Employee Signoff. All CDM Federal and CH2M HILL employees working at the site must sign the attached Employee Signoff for the checklist as well as for the Master HASP.

Site-Specific Investigation-Derived Waste Plan Checklist For EPIC AOC 12

This checklist supplements the Master IDW Plan with site-specific information. Once completed for a specific project, it provides necessary IDW information for each investigation. It is to be taken into the field with the Master IDW Plan.

1. IDW Media:
 Soil cuttings
 Well development or purge water
 Decontamination wastewater
 PPE or disposable equipment
 Other _____

2. Expected Regulatory Status:
 Hazardous
 Solid Waste
 Unknown
 Other _____

3. Site Location: This AOC is an approximately 70 ft by 240 ft of sandy area located north of Buildings M-1 and M-5 adjacent to Blows Creek.

4. Nature of Contaminants Expected: No previous sampling. No information on types of materials stored or disposed at this location.
 Petroleum contamination Herbicides
 Polyaromatic hydrocarbon PCBs
 Pesticides Metals
 Other: Will have analytical results from soil sampling at time of IDW disposal

5. Volume of IDW Expected:
 Drum
 Cubic Yards
 Tons
 5-10 Gallons

6. Compositing Strategy for Sample Collection: One sample per drum (Composited with wastes from EPIC AOC1, EPIC AOC 8, SWMU 22 and IR Site 1).

7. IDW Storage
 As per Master IDW Plan Other _____

8. Waste Disposal
 As per Master IDW Plan Other _____

Site-Specific Quality Assurance Project Plan Checklist For EPIC AOC 12

This checklist supplements the Master QAPP with site-specific information. Once completed for a specific project, it provides necessary quality assurance information for each investigation. It is to be taken into the field with the Master QAPP.

Site: EPIC AOC 12

1. List sampling tasks: Surface and subsurface soil sampling
2. List data quality objectives: **High**, as defined in the Master QAPP, p. 4-1. PARCC Parameters as listed in Table 4-1 of the Master QAPP.

3. Organization:

LANTDIV IR Section Head	<u>Paul A. Rakowski</u>
LANTDIV Navy Technical Representative	<u>Dawn Hayes</u>
USEPA Remedial Project Manager	<u>Todd Richardson</u>
VDEQ Federal Facilities Project Manager	<u>Devlin Harris</u>
CH2M HILL Activity Manager	<u>John Tomik</u>
CDM Federal Project Manager	<u>Dave Schroeder</u>
Quality Control Senior Review	<u>John Tomik</u>
Technical Project Manager	<u>Dave Schroeder</u>
Field Team Leader	<u>John Bambrick</u>

4. EPIC AOC – 12. Table of samples with analyses to be performed and associated QC samples:

TABLE 1
Summary of Soil Samples to be Submitted for Analysis — St. Juliens Creek Annex – AOC 12

Samples	Laboratory Parameter	Samples	Field Duplicates ¹	Field Blanks ²	Trip Blank ³	MS/MSDs ⁴	Equipment Blanks ⁵	Solids Total ⁶	Aqueous Total ⁷
Surface Soil: SJA12SS0100 SJA12SS0200 SJA12SS0300 and QC samples	TCL VOCs	3	1		1			3	1
	TCL SVOCs	3	1					3	
	TCL Pest/PCBs	3	1					3	
	TAL Inorganics and Cyanide	3	1					3	
	Explosives	3	1					3	
	LC-PAH	3	1					3	
Subsurface Soil SJA12SB0103 SJA12SB0203 SJA12SB0303 and QC samples	TCL VOCs	3	1		1			3	1
	TCL SVOCs	3	1					3	
	TCL Pest/PCBs	3	1					3	
	TAL Inorganics and Cyanide	3	1					3	
	Explosives	3	1					3	
	LC-PAH	3	1					3	

- Notes:
- Field duplicates are collected at a rate of 1 per 10 samples per matrix. Number of duplicates will be based on the total number of SSA surface and Subsurface soil samples
 - Field Blanks are collected at a rate of 1 per week per matrix. Number of Filed Blanks will be based on the total number of samples , per matrix, for the SSA investigation.
 - Trip Blanks are shipped at a rate of 1 per cooler for VOCs only.
 - Matrix Spikes/Matrix Spike Duplicates (MS/MSDs) are collected at a frequency of 1 per 20 per matrix. MS/MSDs represent samples for which extra volume must be collected for the laboratory to perform required QC analyses. Triple the normal volumes will be collected for all analyses.
 - Equipment Blanks are shipped at a rate of 1 per day per matrix. Number of equipment blanks will be based on the total number of SSA surface and Subsurface soil samples
 - Solids total consists of the samples, their field duplicates, and the MS/MSDs.
 - Aqueous field QC samples will be analyzed by the TCL organics method (not low concentration).
 - SVOC= semivolatile organic compound
 - PCB = polychlorinated biphenyl
 - Pest = pesticide
 - QC = quality control
 - TAL = target analyte list
 - TCL = target compound list
 - VOC = volatile organic compounds
 - LCPAH = Low Concentration Polynuclear Aromatic Hydrocarbons

This table is based on Navy QA/QC requirements.

5. Analytical Quantitation Limits:

As per Table 8-2 of Master QAPP (LC -PAH) Other (attached)

6. QA/QC Acceptance Criteria (e.g., precision, accuracy)

As per Table 4-1 of Master QAPP Other (attached)

7. Data reduction, validation, and reporting:

As per Section 9 of Master QAPP Other (attached)

8. Internal QC Procedures (field and laboratory):

As per Section 10 of Master QAPP Other (attached)

9. Corrective Action:

As per Section 14 of Master QAPP Other (attached)

10. Other deviations from Master QAPP _____

5. (Cont.) Low Concentration Polynuclear Aromatic Hydrocarbons Analytical Quantitation Limits

Analyte	ug/kg	Analyte	ug/kg
Naphthalene	75	Chyresene	75
Aenaphthylene	75	Benzo(b)fluoranthene	75
Fluorene	75	Benzo(k)fluoranthene	75
Phenanthrene	75	Benzo (a) pyrene	75
Anthracene	75	Indeno (1,2,3-cd) pyrene	75
Fluoranthene	75	Bibenz(a,h,) anthracene	75
Pyrene	75	Benzo (g,h,i) perylene	75
Benzo (a) anthracene	75	Acenaphthene	75

Site-Specific Field Sampling Plan Checklist For EPIC AOC 12

This checklist supplements the Master Field Sampling Plan with site-specific information. Once completed for a specific project, it provides necessary field sampling information for each investigation. It is to be taken into the field with the Master FSP.

Site: EPIC AOC12

1. Tasks to be performed:

- Geophysical surveys
- Soil gas surveys
- Surface water and sediment sampling
- Surface soil sampling
- Soil boring installation
- Subsurface soil sampling
- Monitoring well installation and development
- Monitoring well abandonment
- Groundwater sampling
- In-situ groundwater sampling
- Aquifer testing
- Hydrogeologic measurements
- Biota sampling
- Trenching
- Land surveying (GPS)
- Investigation derived waste sampling
- Decontamination
- Other _____

2. Field measurements to be taken:

- | | |
|--|---|
| <input type="checkbox"/> temperature | <input type="checkbox"/> surveying |
| <input type="checkbox"/> pH | <input type="checkbox"/> magnetometry |
| <input type="checkbox"/> dissolved oxygen | <input checked="" type="checkbox"/> global positioning system |
| <input type="checkbox"/> turbidity | <input type="checkbox"/> soil gas parameters (list): |
| <input type="checkbox"/> specific conductance | <input type="checkbox"/> combustible gases |
| <input type="checkbox"/> organic vapor monitoring | <input type="checkbox"/> water-level measurements |
| <input type="checkbox"/> electromagnetic induction | <input type="checkbox"/> pumping rate |
| <input checked="" type="checkbox"/> ground-penetrating radar | <input type="checkbox"/> other _____ |

3. Sampling program (nomenclature, etc.):

- As per Section 3.1 of Master FSP this site will be A12
- Other Note: The Site Number for

4. Maps of geophysical survey and sampling locations: (See Figures 4-3 and 4-6)
5. Table of field samples to be collected: (See Table 1 in Site Specific QAPP Checklist)
6. Applicable SOPs - pages in Master FSP:

Soil Sampling – page 4.1-1

Ground Penetrating Radar – page 8.2-1

Field Rinse Blank Preparation - page 9.3-1

Homogenization of Soil and Sediment Samples – page 9.5-1

Packaging and Shipping Procedures – page 9.6-1

Chain of Custody – page 9.7-1

Decontamination of Personnel and Equipment – page 10.2-1

7. Site-specific procedures or updates to protocols established in the Master FSP:
-

Site-Specific Health and Safety Plan for EPIC AOC 12

This checklist must be used in conjunction with the Master HASP. This checklist is intended for use by CDM Federal and CH2M HILL employees only. All CDM Federal and CH2M HILL employees performing tasks under this checklist must read and sign both this checklist and the Master HASP and agree to abide by their provisions (see EMPLOYEE SIGNOFF attached to the checklist).

Site: EPICAOC 12

Location(s) See Figure 3-9

This document shall be maintained on site with the Master Health and Safety Plan. It will include as attachments from the Work Plan a site map and the site characterization and objectives for this site.

The procedures described in the Master Health and Safety Plan will be followed unless otherwise specified in this Site-Specific Health and Safety Plan.

1. HAZWOPER-Regulated Tasks

- | | |
|--|---|
| <input type="checkbox"/> Test pit and excavation
<input type="checkbox"/> Soil boring installation
<input type="checkbox"/> Geoprobe boring
<input checked="" type="checkbox"/> Geophysical surveys
<input checked="" type="checkbox"/> Hand augering
<input checked="" type="checkbox"/> Subsurface soil sampling
<input checked="" type="checkbox"/> Surface soil sampling
<input type="checkbox"/> Soil gas surveys
<input type="checkbox"/> Sediment sampling
<input type="checkbox"/> Monitoring well / drive point installation
<input type="checkbox"/> Monitoring well abandonment | <input type="checkbox"/> Groundwater sampling
<input type="checkbox"/> Aquifer testing
<input type="checkbox"/> Hydrologic measurements
<input type="checkbox"/> Surface water sampling
<input type="checkbox"/> Biota sampling
<input type="checkbox"/> Investigation-derived waste (drum) sampling and disposal
<input checked="" type="checkbox"/> Observation of loading of material for offsite disposal
<input type="checkbox"/> Oversight of remediation and construction
<input type="checkbox"/> Other _____ |
|--|---|

2. Hazards of Concern:

- | | |
|--|---|
| <input type="checkbox"/> Heat stress
<input checked="" type="checkbox"/> Cold stress
<input checked="" type="checkbox"/> Buried utilities, drums, tanks
<input type="checkbox"/> Inadequate illumination
<input type="checkbox"/> Drilling
<input type="checkbox"/> Heavy equipment
<input type="checkbox"/> Working near water
<input type="checkbox"/> Flying debris
<input type="checkbox"/> Gas cylinders
<input checked="" type="checkbox"/> Noise
<input type="checkbox"/> Slip, trip, or fall hazards
<input type="checkbox"/> Back injury | <input type="checkbox"/> Confined space entry
<input type="checkbox"/> Trenches, excavations
<input type="checkbox"/> Protruding objects
<input type="checkbox"/> Vehicle traffic
<input type="checkbox"/> Ladders, scaffolds
<input type="checkbox"/> Fire
<input type="checkbox"/> Working on water
<input checked="" type="checkbox"/> Snakes or insects
<input type="checkbox"/> Poison ivy, oak, sumac
<input checked="" type="checkbox"/> Ticks
<input type="checkbox"/> Radiological
<input type="checkbox"/> Other _____ |
|--|---|

3. Contaminants of Concern:

Unknown

4. Personnel:

Field team leader(s)	John Bambrick	703-968-0900
Site safety coordinator(s)	John Bambrick	703-968-0900
Field team members	Lynne France	
	Dave Michailof	

5. Contractors/Subcontractors

Procedures as per Master HASP

Other _____

Name: _____

Contact: _____

Telephone: _____

6. Level of personal protective equipment (PPE) required: Level D
Refer to Table 5.1 of Master HASP, SOPs, and Respiratory Protection, Section 2 of the Site Safety Notebook.

7. Air monitoring instruments to be used:

PID FID
 CGI Dust monitor
 O₂

8. Decontamination procedures:

As per Section 7 of Master HASP

Other _____

9. List any other deviations or variations from the Master HASP:
10. Emergency Response: (See Sections 11 and 12 in the Master HASP and summary of Contingency Plans in Attachment B, Emergency Contacts)
11. Map to hospital (See Attachment B)
12. Emergency Contacts (See Attachment B)

13. Approval. This prepared site-specific checklist must be approved by Mr. Chuck Myers/CDM Federal or other authorized representative

Name Chuck J. Myers Title Mgr. HAS Date 1/29/01

14. Employee Signoff. All CDM Federal and CH2M HILL employees working at the site must sign the attached Employee Signoff for the checklist as well as for the Master HASP.

Attachment B

Health And Safety Emergency Contacts and Hospital Route

SAFETY AND HEALTH PLAN FORM

**ST. JULIENS CREEK ANNEX
SITE SCREENING ASSESSMENT**

CDM FEDERAL PROGRAMS CORPORATION

CDM Federal Safety and Health Program

CTO-141

EMERGENCY CONTACTS			EMERGENCY CONTACTS	NAME	PHONE
Subcontractors	TBA		Health and Safety Manager	Chuck Myers	1-703-968-0900
Site Telephone	TBA	(Mobile Phone)	Project Manager	Dave Schroeder	1-703-968-0900
EPA Release Report No.	1-800-424-8802		Health & Safety Coordinator	Dean Costello	1-703-968-0900
CDM 24-Hour Emergency	1-703-754-0700	Chuck Myers (home)	Client Contact	Dawn Hayes	1-757-322-4792
Facility Management	1-757-396-3221	Shipyard Duty Desk	Other (specify)		
Site Spills	1-757-322-2866	COMNAVBASE Duty Desk	Environmental Agency	EPA Region III	1-215-597-9800
Emergencies	1-757-396-3333	Shipyard Emergency #	State Spill Number	Virginia Waste Management Department	1-800-468-8892
			Fire Department	Shipyard Fire Dept.	1-757-396-3335
			Police Department	Shipyard Security Dept.	1-757-396-5111
<p>CONTINGENCY PLANS Summarize below: Evacuate site if any unexpected hazardous conditions are encountered. Site staff, if evacuated, will congregate upwind of the site in a predesignated area (to be announced at the daily health and safety meeting). If a work team observes hazards for which they have not been prepared, they will withdraw from the area and call the CDM Federal CHSM or the local Health & Safety Coordinator for guidance. Without regard to monitoring instrument reading, CDM Federal personnel will leave site and upgrade their level of protection if they experience nausea or dizziness.</p>			State Police	Virginia State Police	1-757-494-2434
			Health Department	Chesapeake Health Dept.	1-757-382-8600
			Poison Control Center	National	1-800-332-6633
			Occupational Physician	Dr. Thomas Winters	1-800-350-4511
			MEDICAL EMERGENCY		
			Hospital Name:	Mayview Hospital	1-757-398-2200
			Hospital Address:	Oakley Street	
HEALTH AND SAFETY PLAN APPROVALS			Name of Contact at Hospital: Emergency Room		
Prepared by:	<i>John Hambrick</i>	Date: 1/29/01	Name of 24-Hour Ambulance: Shipyard Emergency		
SHSC Signature:	<i>John Hambrick</i>	Date: 1/29/01	Route to Hospital (Attach map with route to hospital) Leave main gate of Annes and take left onto Victory Blvd. At Route 17 (George Wash. Hwy) take a right and go north. Make left onto Frederick Blvd. And continue on Frederick Blvd. Until it dead ends. Make left onto High Street, hospital is on the right at first light.		
HSM Signature:	<i>Chuck Myers</i>	Date: 1/29/01			
			Distance to Hospital: Approximately 5 miles		



St. Julens Creek Annex

CTO-141

Maryview Hospital

Route

CDM Federal Programs Corporation

A Subsidiary of Camp Dresser & McKee Inc.

*consulting
engineering
construction
operations*

13135 Lee Jackson Memorial Highway, Suite 200
Fairfax, Virginia 22033
Tel: 703 968-0900 Fax: 703 968-0915