

Site Management Plan

Former Nansemond Ordnance Depot

FINAL

Fiscal Year 2003



**US Army Corps
of Engineers** ®
Norfolk District



Issued December 5, 2002

Site:

The Former Nansemond Ordnance Depot
Suffolk, Virginia
C03VA004500, Formerly Used Defense Site

Prepared By:

United States Army Corps of Engineers
Norfolk District
Norfolk, Virginia 23510-1096

**Site Management Plan
Former Nansemond Ordnance Depot
Fiscal Year 2003**

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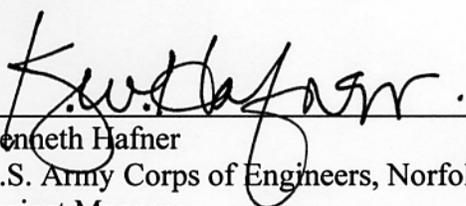
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TABLE OF CONTENTS

1.	Introduction.....	1-1
2.	Purpose.....	2-1
3.	Organization Chart.....	3-1
4.	FNOD History.....	4-1
5.	Summary of NPL Status	5-1
6.	Synopsis of Screening Methodology: Technical Approach	6-1
7.	Site Source Areas and Areas of Concern.....	7-1
	S-1. [OU-5] TNT Disposal Area	7-5
	S-2. [OU-1] James River Beachfront Area.....	7-7
	S-3. [OU-7] Impregnite Kit Area	7-9
	S-4. [OU-3] Horseshoe Pond Area.....	7-11
	S-5. [OU-2] Main Burning Ground and Steamout Pond.....	7-12
	S-6. [OU-4] Track K Dump (Tire Pile and Paint Cans).....	7-14
	A-1. [POU-8] Nansemond River Beachfront.....	7-15
	A-2. [OU-6] Streeter Creek and Lakeview Drive Ground Scars	7-17
	A-3. [OU-6] Near and Off-Shore Areas.....	7-18
	A-4. [OU-6] GE Pond/Nansemond Culvert.....	7-20
	A-5. [OU-6] Tidewater Community College Lake	7-21
	A-6. [POU-10] Marine Corps Power Generation	7-22
	A-7. [OU-6] Area J Lake and Possible Burning Ground Area	7-23
	A-8. [POU-11] Track A - Explosive Magazine Line (Disposal Pit).....	7-24
	A-9. [POU-11] Track A & B Burning Ground	7-25
	A-10. [POU-9] Track G Explosive Magazine Line (Scars).....	7-26
	A-11. [POU-9] Track H and I Explosive Magazine Line (Scars).....	7-27
	A-12. [POU-11] Track J Explosive Magazine Line (Scars)	7-28
	A-13. [POU-10] Unknown Abandoned Structures near WWTP	7-29
	A-14. [POU-9] Track K Explosive Magazine Line (Scars).....	7-30
	A-15. [POU-9] Track K- Explosive Magazine Line Landfill	7-31
	A-16. [POU-11] Removed Steam Heating Plant	7-32
	A-17. [POU-10] PCB Transformer Removal.....	7-33
	A-18. [POU-10] Suspected Underground Storage Tanks	7-34
	A-19. [POU-?] TCE Contamination Adjacent to the James River Beachfront Area.....	7-35
	A-20. [POU-10] Abandoned Water Treatment Plant near Building H-413....	7-36
	A-21. [POU-9] Officer's Pool Chlorine Containers	7-37

	Other Relevant Investigations and Activities	7-38
	Land Use Control Implementation Plan.....	7-38
	Removal Action Area 1: TCC Geophysical Anomaly Investigation	7-38
	Background Study.....	7-39
	Pesticide Drum Area	7-40
	Hydrologic Conceptual Site Model.....	7-40
	Residential Well Sampling.....	7-41
8.	Potential HTRW/Dig Sheet Items.....	8-1
9.	Ordnance Clearance Activities	9-1
10.	Acronyms and Abbreviations	10-1
11.	References.....	11-1
12.	Site Figure.....	12-1
13.	Site Schedules	13-1
14.	Current DEQ and EPA Comments, USACE Responses to comments..	14-1

FIGURES

Organization Chart	Section 3
Figure 7.1	Page 7-2
Figure 7.2	Page 7-3
Site Figure	Section 12

TABLES

Table 7.1	Page 7-4
Table 8.1	Page 8-2
Table 9.1	Page 9-2

1. INTRODUCTION

This report presents the Site Management Plan (SMP) for the United States Army Corps of Engineers (USACE), Norfolk District activities at the Former Nansemond Ordnance Depot (FNOD) in Suffolk, Virginia. the FNOD qualifies as a Formerly Used Defense Site (FUDS) pursuant to Public Law 98-212, the Environmental Restoration Defense Account, and the Defense Environmental Restoration Program (DERP), Chapter 160 of the Superfund Amendment and Reauthorization Act of 1986. By law and through Department of Defense (DoD) regulations, the USACE has been assigned the responsibility for environmental investigations and remediation of FUDS resulting from DoD activity. Norfolk District is the USACE geographic district responsible for oversight of FUDS activities at the FNOD. Norfolk, Baltimore, and Huntsville Districts are participating in site investigation and restoration activities.

In January 1999, the FNOD was proposed for inclusion on the National Priority List (NPL), which is also known as Superfund (64FR2950; January 19,1999). In July 1999, the U.S. Environmental Protection Agency (USEPA) made a final determination and placed the FNOD on the General Superfund List for private sites. (64FR39878; July 22, 1999)

Federal Agencies remediating Superfund sites commonly enter into Inter-Agency Agreements (IAGs) that cover roles and responsibilities during the clean-up. The final IAG is still in negotiation. For the purposes of this report, all references to an IAG will be to the draft IAG dated June 2, 1999, which contains mostly IAG model language developed between USEPA and DoD. The USEPA has listed the FNOD as a Non-Federal Facility Superfund Site, as the Federal Government does not currently control any property at the FNOD, and the USEPA has named the Federal Government, specifically the DoD, as a Potentially Responsible Party (PRP) for addressing environmental issues at the FNOD.

This Site Management Plan (SMP) contains the Fiscal Year (FY) 2003 work plan and work schedules for each site area, as well as a description of each area. Each site area section contains details about the location, site use and work history, and file numbers of related documents.

Related documents are contained in the USACE Norfolk District Administrative Record File (ARF) located at the USACE Norfolk District, Norfolk, Virginia. Additional resources at the Norfolk District used to organize project materials include the following: Photo Database – contains digital photo files with searchable database descriptors; Ordnance Database – contains descriptors of ordnance found during site investigations; GIS – site historical map and photo imagery is georeferenced to a common datum and site data is contained in an Access database.

PUBLIC INVOLVEMENT

The USACE initiated formation of a Restoration Advisory Board (RAB) following FUDS guidance. The RAB meets bi-monthly as a means to provide an avenue for public involvement and input on the project. Citizens are encouraged to attend RAB meetings and to review the site documents on file in the Information Repository at the Tidewater Community College Portsmouth Campus Library. The Norfolk District also conducts Public Affairs Workgroup meetings as required by project activities. Members of the workgroup include the Public Affairs Officers (PAO) from the Norfolk District CoE, the EPA, the Virginia DEQ, the City of Suffolk, and all current property owners that choose to participate.

2. PURPOSE

The purpose of this SMP is to disseminate environmental site clean-up information in accordance with the requirements of an IAG. The IAG requires the following information to be included in the initial plan and all subsequent revisions:

- I. Proposed environmental clean-up responses and actions, and schedules for response actions.
- II. Deadlines for the submittal of primary documents covering the current year plus the following two out years.
- III. A listing of all identified Site Screening Areas (SSAs), Areas of Concern (AOCs), Operable Units (OUs), etc.
- IV. Identification of any primary actions:
 - Deadlines.
 - Near term milestones.
 - Out year milestones.
 - Target dates.
 - Project end dates.

Additionally, the SMP for the FNOD will be used to provide references to germane site documents, disseminate project status information to all individuals and organizations impacted by site activities, and document all schedule impacts and the reasons for those impacts. The ARF database has been developed to assist with project document management, and is constantly updated with documents on file at the USACE Norfolk District. The salient features of the ARF database are described in the Administrative Record File Manual (ARF 02-04-003), on file at the USACE Norfolk District and provided to all project team members. Citations in this text refer to documents by their Administrative Record File number as 'ARF ###-##-###'.

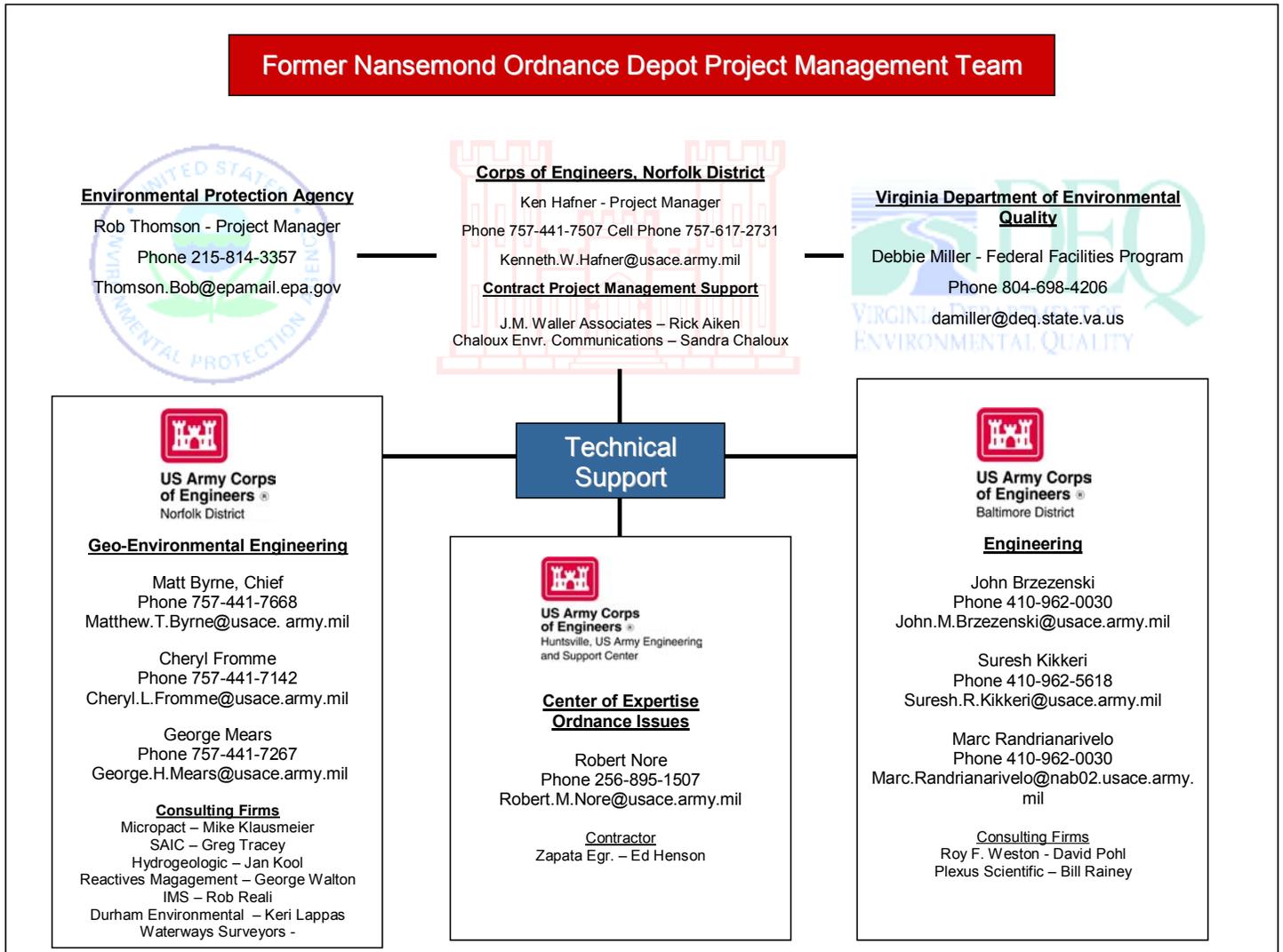
Historic Preservation Act Compliance

All site work completed under this SMP will be in compliance with State and Federal historic preservation regulations. To insure compliance with Section 106 of the National Historic Preservation Act, a Programmatic Agreement was signed by the USACE Norfolk District, the USEPA Region III, the Virginia State Historic Preservation Officer (SHPO), and other interested parties.

The Archaeological Work Plan (AWP) appended to the Programmatic Agreement (PA) details how the agreement will be implemented for all site activities. The AWP has been developed and approved by the USACE Norfolk District, the USEPA and the SHPO. The plan calls for the review of all project work plans, contracts, scopes of work and other planning documents by the Archaeologist to identify any possible adverse effects to significant historic properties by site activities. The plan includes a map of site areas which have a high, medium, and low probability

of archaeological resources. The AWP also provides for review of ground-disturbing activities that occurred prior to implementation of the PA, monitoring of upcoming ground disturbing actions in high probability areas, and procedures to be followed in the event of an unexpected discovery of archaeological resources. The Programmatic Agreement includes an agreement through which the USACE Norfolk District's Archaeologist will review USEPA work plans on non-DoD site work.

3. ORGANIZATION CHART



4. FNOD HISTORY

The Nansemond Ordnance Depot originated as Pig Point Ordnance Depot in 1917 and played an important role in the storage and shipment of various types of munitions during both World Wars I and II. The site is located in Suffolk, Virginia at the mouth of the Nansemond River, and covers approximately 975 acres. The site is bounded by the Nansemond River to the west, the James River to the north, and Streeter Creek to the east.

The Pig Point Ordnance Depot was originally constructed to support the Port of Embarkation in Newport News and functioned as a temporary storage and transshipment facility. The mission of Pig Point changed in 1919 to an intermediate storage and distribution depot. Captured enemy munitions were also processed at this location. The Depot received ammunition from overseas, prepared ammunition for storage, transferred ammunition to other locations, and performed other salvage and disposal operations. Between World Wars I and II, these operations continued on both domestic and captured munitions. In 1929, the name was officially changed to the Nansemond Ordnance Depot (NOD).

The original depot included 28 standard ammunition magazines, 25 high explosive magazines, 13 smokeless powder magazines, 8 primer and fuse magazines, a large warehouse, 16 barracks buildings, 2 officers quarters, a hospital, a garage, a Fire House, a machine shop, an electric storage battery charging station, and other support buildings. Other construction included a pier, jetties, guard towers, a water tower, a renovation and salvage plant, railroad tracks, and other roads within the site.

In 1950, the facility was transferred to the Department of the Navy and was called the Marine Corps Supply Forwarding Annex. At this time, there are no further details of operations at the site between 1950 and 1960. The USACE Norfolk District and USEPA continue to research Marine Corps activities. In 1960, the site was declared excess and was acquired by the Beazley Foundation Boys Academy, with a Virginia Department of Highways right of way easement of 5.87 acres. Soon after, the Academy transferred 207 acres to the Virginia Electric Power Company (VEPCO), now Dominion Lands, Incorporated. In 1965, 104.05 acres were conveyed to General Electric (GE), and in 1966, the County of Nansemond acquired a 4.70-acre road right of way. In 1968 the military academy closed, and the Beazley Foundation donated the remaining property to the State Board of Community Colleges. In 1977, a 79.95 acre parcel was conveyed to Hampton Roads Sanitation District (HRSD). The remaining 579.6 acres is currently owned by the State Board of Community Colleges, and is the location of the Tidewater Community College (TCC) Portsmouth Campus.

The FNOD site has been under investigation by the USACE since 1987. Additional site information is presented in the Archives Search Report (ASR) (ARF 01-13-006-F.)

Current property owners are: Virginia Community College System, GE, Virginia Department of Transportation (VDOT), HRSD, Dominion Lands, Continental Bridgeway Office Park, and SYSCO Food Services. Currently, GE is leasing their building to various companies and land to the U.S. Navy for storage. This property will be leased or sold and is zoned for commercial development. The VDOT has constructed Interstate 664 through the eastern portion of the former depot, and has a maintenance facility adjacent to the highway. An HRSD wastewater treatment plant is located to the east of I-664, and a small portion of that property is on former

depot land. Continental Bridgeway Office Park has a new office building group in Bridgeway Commerce Park completed at College Drive between Wellner and Bridgeway Commerce Park Drive. Sysco Food Services, which has only a very small portion on former depot land is also located in the Bridgeway Commerce Park, with large-scale warehouse and shipment operations.

5. SUMMARY OF NPL STATUS

The USEPA released the Final Hazard Ranking System (HRS) Package (ARF 01-13-031) on January 11, 1999 for the site, designated "USEPA Facility ID# VAD123933426". The USEPA evaluated seven waste sources (called Sources 1, 2, 3, 4, 5a, 5b, and 6) and assigned a site score of 70.71. A score of 28.5 or above qualifies the site for placement on the NPL. The following is an excerpt from the HRS package:

"In the spring of 1987, it was found that bulk explosives, small arms munitions, and other ordnance items, both spent and unexploded, had been disposed of in a 2 to 3 acre area adjacent to College Drive [1]. The U. S. Army Corps of Engineers (USACE) conducted a confirmation study of this area, hereafter referred to as the TNT Removal Area, in June and July 1987 under the Defense Environmental Restoration Program. This study showed the presence of ordnance and ordnance-related materials and a slab of crystalline 2,4,6-trinitrotoluene (TNT) estimated to weigh several tons. Between November 1988 and February 1989, the following materials were removed from the TNT Removal Area: 4,400 pounds of boosters, 260 pounds of bulk explosives, 1,360 pounds of small arms/miscellaneous, and 30,275 pounds of contaminated soil. USACE conducted additional fieldwork in the TNT Removal Area between November 1989 and February 1991 as part of a Remedial Investigation and Feasibility Study (RI/FS). Chemicals of Concern identified in the RI/FS included metals, TNT, TNT degradation products, and RDX. Between April and June 1992, 316 tons of contaminated soil and a small amount of miscellaneous ordnance were removed from the TNT Removal Area. The residual soil contamination is being evaluated as Source 1.

A debris area is located on a bluff and beach along the James River at the north end of the property, to the west of and adjacent to Interstate 664. Buried and partially buried debris identified in this area includes ordnance scrap, empty drums, and miscellaneous metallic slag. The beachfront disposal area is being evaluated as Source 2."

[1] ARF 01-05-003-F

The description above contains the primary reasons that the site was investigated by the EPA for inclusion on the NPL. Additional Source Areas described in the HRS included the Impregnite Kit Area (Source Area 3), the Horseshoe Pond Area (Source Area 4), the Steamout Pond and Burning Ground Areas (Source Areas 5A and 5B) and the Track K Dump (Source Area 6). The Source Areas are as shown on the site figure (Figure 1).

New developments occurred during FY 2002 regarding the way in which to proceed with the Impregnite Kit, the Horseshoe Pond, and the Track K Dump Areas. For example, the questionable NPL status of the Impregnite Kit Area led to new decisions by the project team on how to progress through the site investigations. Further details on the decisions made and work completed can be found in each area's section in this plan.

6. SYNOPSIS OF SCREENING METHODOLOGY: TECHNICAL APPROACH

The Source Areas described in the USEPA site listing for the FNOD are investigated following the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) regulations and guidance. Other potential source areas at the FNOD that warrant an investigation based on the results of historical aerial photograph examination or other evidence are evaluated using a formalized Site Screening Process (SSP). The potential source areas are proposed first as potential Areas of Concern (AOC) by members of the project delivery team. An AOC is an area where past activities had the potential to leave contaminants in an adjacent medium – surface soil, subsurface soil, sediment, surface water, and/or groundwater. Potential AOCs are examined by the entire project delivery team to determine if there is enough evidence to list them as an official AOC in the Site Management Plan, with a team consensus. The approach to evaluate each area of concern is fully described in the SSP document (ARF 01-13-049-v2) developed by the USACE Norfolk District for this project. A brief description of the process is provided below.

The FNOD SSP begins with a desktop audit and site visit. Generally, screening for a site such as this would normally begin by obtaining aerial photos and establishing reference points. The reference points for examination of the historical aerial photographs are well established for the FNOD, and a set of aerials has been georeferenced to the common points, so the first step for a potential AOC screening is the desktop audit. The desktop audit includes examination of historical documents and historic and current aerial photographs. The purpose is to determine if previous activities indicate a need to investigate that area further. The site visit provides an opportunity to evaluate current site conditions in person and further develop the site characterization. During the site visit, a visual inspection is done where observations of site topography, ecology, and natural and man-made features are recorded and documented with photos to support desktop audit conclusions. Screening level samples may also be taken during the initial site visit. The desktop audit and site visit are documented in a report that also presents the results of any research or screening sampling as well as a site-specific Conceptual Site Model (CSM). If the desktop audit shows that there are no concerns at the AOC, the AOC may be removed from the site AOC list upon agreement by the project delivery team. This agreement to remove an AOC will be documented in minutes from the meeting and in the AOC section in the next year's version of the Site Management Plan.

The next step in the SSP for an AOC is to develop the SSP work plan for conducting biased sampling of all potentially affected media identified during the site visit and/or historical survey. The project team agrees on the sampling and analysis to be performed by accepting the SSP work plan, which will be prepared by the USACE. Each potentially affected medium is analyzed for all compounds on the project suite of analyses, including Superfund Target Analyte List and Target Compound List analytes. The full list of analytes may be found in the SSP or in the QAPP in the Master Project Work Plan. Total Petroleum Hydrocarbons (TPH) and Chemical Warfare Material and degradates (CWM) will be added to the analysis list if the desktop audit has indicated these materials may be present at the location. Region III EPA will sample for CWM, as needed, based on an agreement during the June 2002 Partnering Meeting (Meeting Minutes). The location of each sampling point is recorded, and all data – Virginia State Plane

coordinates, sampling information, chemical results and other field generated data – is collected according to USACE requirements and placed in a specially designed environmental database maintained by the USACE Norfolk District. The chemical results are independently validated and statistically characterized and database queries are performed to compare the validated results to regulatory limits (screening level risk assessment). The risk screening is performed for both human health and ecological risk according to Section 6 of the SSP. Results of the comparison to regulatory limits and the risk screening are used to determine if the AOC requires a removal action, additional study (RI/FS) or can be removed from further consideration. Data analysis, visualization and reporting are subsequently supported by linking database queries with ArcView (or comparable software) and/or GMS (Groundwater Modeling System).

Data management at the FNOD is described in the Environmental Data Management Plan for Technical Managers and Project Managers (ARF 02-04-003) by the USACE Norfolk District.

7. SITE SOURCE AREAS AND AREAS OF CONCERN

This section contains information on all site areas. Prior to 2001, the Site Management Plan (ARF 01-13-060-F), contained the areas divided into Source Areas, Removal Action Areas, and Areas of Concern. The FY 2002 and subsequent versions of the SMP describe areas as either Source Areas, numbered S-XX, or AOCs, numbered A-XX. This SMP also lists the EPA designations of Operable Units (OUs) and Possible Operable Units (POUs) by OU (numbers 1 through 7) and POU (numbers 8 through 11). The section for each area contains a description of the size and location, history, what concerns prompted identification as a Source Area or an AOC, a narrative with a brief description of the documented information available on that site, and the plan for the current fiscal year.

Each component required for each phase of site work will be approved separately by team members. Briefly, investigation of all Source Areas will continue following CERCLA guidance and proceed following the steps in Figure 7.1 on the following page. Figure 7.2, the FNOD CERCLA Clean-Up Master Flow Chart, illustrates the past work, present stage, and planned future path for the CERCLA clean-ups. This chart assumes a worst-case scenario, assuming all AOCs where at least one AOC in each group proceeds to cleanup under proceeding under CERCLA. This chart will be revised each year as site investigations proceed. Table 7.1, the OU Planner, provides the list of Source Areas and AOCs names with numerical SMP designations, FUDSMIS (Formerly Used Defense Site Management Information System) programming designations (including OU/POU numbers), and Cost to Complete (CTC) programming requirements codes. AOC groupings can change based on the current understanding of present risk and changes in major stakeholder requirements.

Investigation of AOCs will follow the steps as described in the SSP (ARF 01-13-049-v2) to determine if the AOC must go through the CERCLA process above.

The Other Relevant Investigations and Activities section follows the AOC sections. This section includes work which does not fall within a specific AOC and work in areas that have not yet been determined to be AOCs. If investigations into other areas show that there may be concerns which need to be addressed by the DoD, the work area may be elevated to an AOC by project team consensus.

The current Gantt schedules for site work are in Section 13.

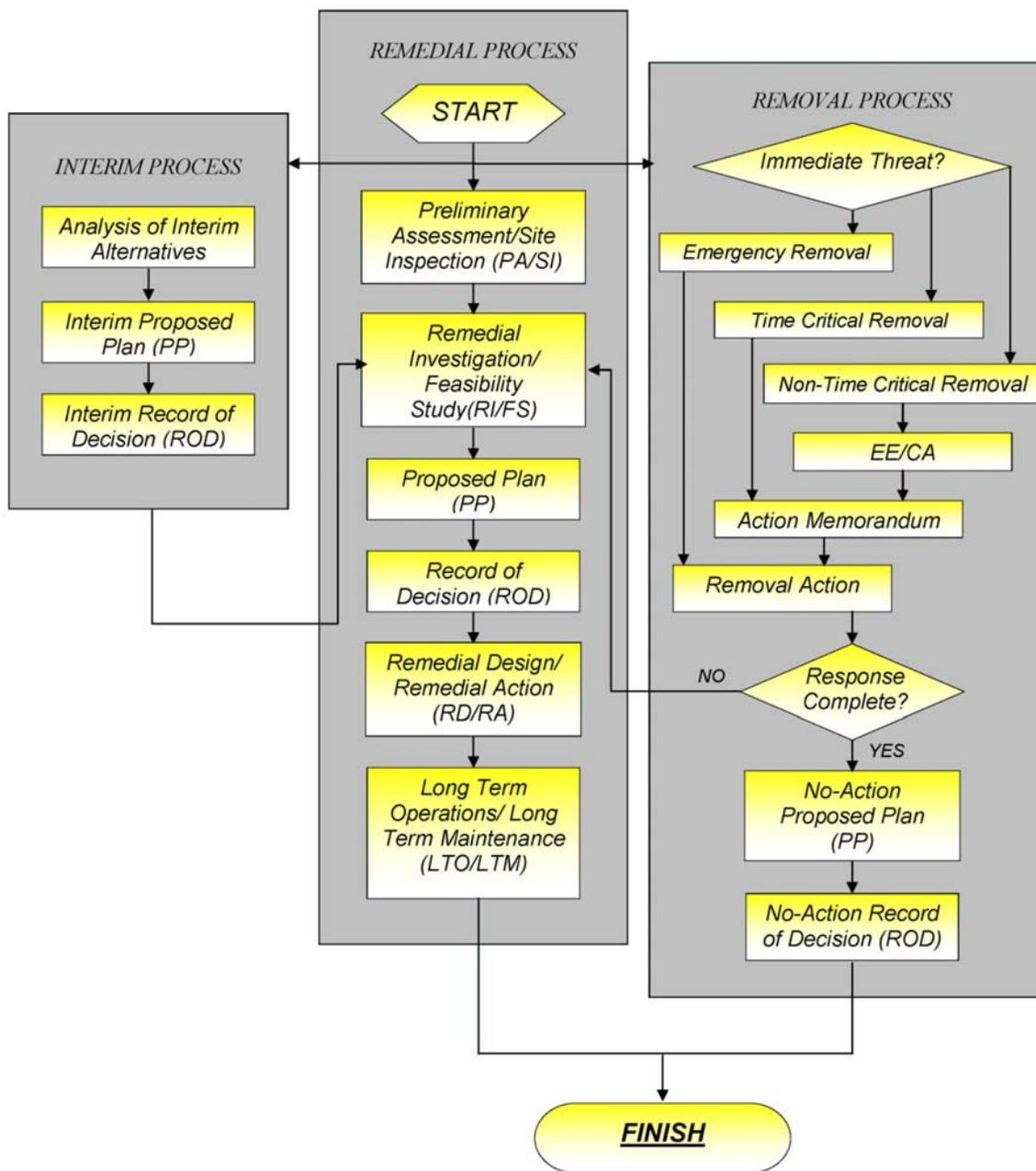


Figure 7.1: The CERCLA Process

FNOD CERCLA CLEAN-UP MASTER FLOW CHART																	
CALENDAR YEAR	OE-1	OU-5	OU-7	OU-4	OU-1	POU-8	OU-2	OU-3	OU-6				POU-9		POU-10	POU-11	RODS
	OE REMOVAL ACTIONS	TNT AREA	IMPREGNITE KIT AREA	TRACK K DUMP (TIRE PILE AND PAINT CANS)	JAMES RIVER BEACH FRONT (JRB)	NANSEMOND RIVER BEACHFRONT (NRB)	MAIN BURNING GROUND (MPG)	HORSE-SHOE POND (HSP)	OFF SHORE STUDY	NEAR SHORE JRB / PIER	NEAR SHORE NRB / HSP	INLAND LAKES	GROUP B AOCs	GE POND NANSEMOND CULVERT	GROUP C AOCs	GROUP D AOCs	
1998	EE/CA	RI															
1999	RA	RI															
2000	RA	RI					RI	RI	SLERA								
2001	RA	RI		EE/CA IRA	EE/CA IRA	EE/CA IRA	RI	RI	SLERA								
2002	RA	RI		EE/CA IRA	RI/FS	SSP	RI	RI	BERA	BERA HHRA				SSP			
2003	RA	RI	ROD *HSP P-DELIST [NOIPD]	ROD RA COMP [RA REPT]	RI/FS	SSP	RI	RI	ROD RA COMP [RA REPT]	PIER & JRB DATA	BERA HHRA	SSP	SSP	SSP CLOSE OUT REPT			3
2004	RA	ROD		P-DELIST [NOIPD]	ROD RA COMP [RA REPT]	RI/FS	FS	FS	P-DELIST [NOIPD]		NRB *HSP DATA	SI	SI		SSP		2
2005	RA	RD/RA RA COMP [RA REPT]			LTO/LTM	ROD	FS	ROD				RI/FS	RI/FS		SI	SSP	3
2006	ROD RA COMP [RA REPT]	LTO/LTM			LTO/LTM	LTO/LTM	FS	RD/RA RA COMP [RA REPT]				ROD	ROD		RI/FS	SI	2
2007	CLOSE OUT REPORT	LTO/LTM			LTO/LTM	LTO/LTM	ROD	LTO/LTM				RD/RA	RD/RA		ROD	RI/FS	2
2008		LTO/LTM			LTO/LTM	LTO/LTM	RD/RA RA COMP [RA REPT]	LTO/LTM				RA COMP [RA REPT]	RA COMP [RA REPT]		RD/RA	ROD	1
2009		5 YEAR REVIEW			5 YEAR REVIEW	5 YEAR REVIEW	LTO/LTM	5 YEAR REVIEW				P-DELIST [NOIPD]	P-DELIST [NOIPD]		RA COMP [RA REPT]	RD/RA	
2010		P-DELIST [NOIPD]			P-DELIST [NOIPD]	P-DELIST [NOIPD]	LTO/LTM	P-DELIST [NOIPD]							P-DELIST [NOIPD]	RA COMP [RA REPT]	
2011							5 YEAR REVIEW										CONST COMP [PCOR]
2012							P-DELIST [NOIPD]										SITE COMP [FCOR]
2013																	DELIST [NOID]
2014																	

LEGEND

- STUDIES
- DECISIONS/CLEAN UP
- LTO/LTM
- DELIST/CLOSE OUT

AS OF 20 SEP 2002

Figure 7.2: FNOD CERCLA Clean-Up Master Flow Chart

Table 7.1: OU Planner

FNOD SITE	Source Area / AOC	FUDSMIS PROJ	FY02 FUDSMIS	CTC Requirement
Ordnance & Explosives OE Land Use Controls		2 2	975 acre OE 975 acre OE	
TNT Disposal Area	1	1	OU-5 TNT Area	RI/FS-PCO
James River Beachfront	2	9	OU-1 JRB Area	LTM-PCO
Impregnite Kit Area	3	4	OU-7IKA	NONE
Horseshoe Pond	4	5	OU-3 HSP	FS-PCO
GE Burning Ground	5	6	OU-2 MBG	FS-PCO
Track K Dump	6	10	OU-4 TKD	PCO
Nansemond River BF	AOC 1	15	POU-8 NRB	RI/FS-PCO
TCE Contamination	AOC 19	3	975 Acre HTW	RI/FS-PCO
Pesticide Drum Area		3	975 Acre HTW	PCO
Hydrologic CSM		3	975 Acre HTW	CSM
Streeter Creek	AOC 2	11	OU-6 Off Shore, GP A AOCs	RI/FS-PCO
Off Shore Area (far)	AOC 3a	11	OU-6 Off Shore, GP A AOCs	PCO
Off Shore Area (near)	AOC 3b	11	OU-6 Off Shore, GP A AOCs	RI/FS-PCO
Area J Lake	AOC 7	11	OU-6 Off Shore, GP A AOCs	RI/FS-PCO
TCC Lake	AOC 5	11	OU-6 Off Shore, GP A AOCs	RI/FS-PCO
GE Pond Nan Culvert	AOC 4	11	OU-6 GP A AOCs	SI-PCO
O'Club Pool	AOC 21	12	POU-9 GP B AOCs	PCO
Track G Line Scars	AOC 10	12	POU-9 GP B AOCs	SI-PCO
Track Hand I Line Scars	AOC 11	12	POU-9 GP B AOCs	SI-PCO
Track K Line Scars	AOC 14	12	POU-9 GP B AOCs	SI-PCO
Track K Land Fill	AOC 15	12	POU-9 GP B AOCs	SI-PCO
Abandoned Structures	AOC 13	13	POU-10 GP C AOCs	SI-PCO
PCB Transformers	AOC 17	13	POU-10 GP C AOCs	SI-PCO
Suspected USTs	AOC 18	13	POU-10 GP C AOCs	SI-PCO
Abandoned Water TP	AOC 20	13	POU-10 GP C AOCs	SI-PCO
Marine Cops Pwr Gen	AOC 6	13	POU-10 GP C AOCs	SI-PCO
Track A and B Burn Gnd	AOC 9	14	POU-11 GP D AOCs	SI-PCO
Track J Line Scars	AOC 12	14	POU-11 GP D AOCs	SI-PCO
Removed Steam Plant	AOC 16	14	POU-11 GP B AOCs	SI-PCO
Track A Disposal Pit	AOC 8	14	POU-11 GP D AOCs	SI-PCO

S-1. [OU-5] TNT Disposal Area

SIZE: The TNT Disposal Area is 2 to 3 acres in size.

LOCATION: TCC property along the north side of College Drive at Jamestown Road.

HISTORY and PAST WORK: The TNT Area was originally identified in 1987 after solid TNT was found at the site. Bulk explosives were removed along with contaminated soil. Some contamination remains in site soils: work has shown some metals and explosives contamination in groundwater and soil in the immediate vicinity with localized soils having up to 47,000 ppm explosives compounds. Previous investigations and removal actions are summarized below.

- In 1987, the Edge Group (Edge) collected 36 soil samples from 15 test pits. Edge also performed geophysics and installed, developed and slug tested six monitoring wells. The slab of TNT (estimated at 100-150 cubic feet of TNT, with a thickness of 2 – 6 inches) was found during this investigation. (ARF 01-12-001-F, 01-01-002).
- From November 1988 to early 1989, EOD Technology, Inc. performed ordnance clearance. The crystalline TNT slab was removed, as well as boosters and miscellaneous ordnance including small arms.
- Between November 1989 and February 1991, IT Corporation sampled 20 soil borings, installed 5 monitoring wells, collected 10 surface samples from suspected surface run-off paths and resampled 12 monitoring wells and 4 drinking water wells. Between April and May 1992, 15 tons of surficial soil, 80 tons of soil from the burn pit, 45 drums of drill cuttings, and 35 drums of decontamination water were removed from the site. The site was backfilled with 435 tons of clean fill and the temporary fence was removed (ARF 01-05-003-F).
- USACE received a letter from USEPA dated February 7, 1994 stating that the removal actions had been satisfactorily completed (ARF 04-01-003) but that further work may be required.
- In 1995, two monitoring wells were abandoned, one was replaced, and five new wells were installed. Two rounds of sampling were performed for explosives and lead (ARF 01-05-004).
- In December 1998, USACE collected surface and subsurface hand augur samples from 18 locations and analyzed for compounds on the Superfund Target Compound List, Superfund Target Analyte List, Cyanide and Explosives (USACE Norfolk District, unpublished).
- A contract was awarded in summer 1999 to Virginia Geotechnical Services to perform additional soil samples and groundwater samples to support RI efforts (ARF 02-03-014-v1). USACE Norfolk District has rewritten the plan and has resubmitted it to regulators for review. Once the plan has been finalized based on comments received, the sampling event will be scheduled.
- During 2002, a number of adapter boosters, 62 lbs of 30 cal ammunition, and approximately 108 pounds of crystalline TNT were removed from the area

surrounding Pit 18. Clearance of additional grids will continue to the end of CY 2002. (see Ordnance Clearance, Section 9).

FUTURE WORK: Data collected from the next sampling event will be used along with appropriate historical data to delineate both groundwater and soil contamination and to plan the RI for the area. Crystalline TNT located during the ongoing magnetic anomaly investigation will be removed. Any remaining TNT in the soil will be addressed during the HTRW investigation. Norfolk District is compiling GIS information available on the site to support investigation efforts.

S-2. [OU-1] James River Beachfront Area

SIZE: The James River Beachfront (JRB) AOC is approximately 14 acres in size.

LOCATION: The JRB is located along the south bank of the James River on the TCC property directly west of the I-664 Monitor-Merrimac Bridge-Tunnel.

HISTORY and PAST WORK: The JRB AOC is designated Source Area 2 in the HRS Documentation Record. The site was composed of a partially grassy area and partially wooded area which sloped steeply down to the water line, where there is a sandy beach. This area was used during DoD operations as a disposal area, which is evident on several aerial photos. The majority of the waste in the landfill consisted of various scrap metals, concrete slabs, bricks, and other construction debris. Due to erosion of the slope, waste materials are now found offshore. This area has had high rates of erosion at the beachfront, and is now protected by a revetment constructed after the removal activities in Summer 2001. The area is also identified as the Hampton Roads Beachfront.

- USACE (St. Louis District) performed a visual inspection in November 1993, and found construction debris, concrete, bricks, and water and sewer pipes, six inert 170 mm German artillery rounds, three inert artillery fuses, and containers of various sizes similar to chemical agent storage/transport containers. The above materials were found on the beach and protruding from the bluff (ARF 01-13-006-F).
- Roy F. Weston conducted a removal assessment for the USEPA in November and December 1995 which included: examination of ordnance for potential hazard; field screening of soil for explosives; soil sample collection for BNA, explosives, TAL metals, TCLP metals, and asbestos analysis; a geophysical survey of fill area extent; and surface clearance and subsurface survey by EOD (ARF 01-13-012-F).
- Foster Wheeler also performed a reconnaissance for an EE/CA of the river front area west of the I-664 bridge in November/December 1993 and January 1996 which revealed 170 mm German artillery rounds and rusted containers. The HTW EE/CA (ARF 01-04-012-F) for the James River Beachfront source area was submitted to the USEPA and Virginia DEQ in December 1999, and the Final EE/CA was published in April 2000.
- A site reconnaissance by Gannett Fleming for the USEPA in June 1996 found similar debris on the beach and in the bluff, and small metal cylinders stamped with "Explosive Danger" which appeared conglomerated by burning.
- Geophysical reconnaissance, test pits, and visual reconnaissance in 1997 found metal pipelines, riprap, debris, rebar, and burn residue, but no potential Unexploded Ordnance (UXO) items.
- USACE Norfolk District installed a chain-link fence around the beachfront area in 1996 and repaired the fence in 1999 and 2000.
- USACE Baltimore completed a site investigation in 1998 (ARF 01-13-027-F). This effort included soil and water sampling.

- USACE Baltimore completed the Risk Based Cleanup Criteria (RBC) document (ARF 01-13-063-F) determining cleanup levels for removal activities at JRB.
- An archaeological site previously discovered at the JRB was determined to likely be a slave quarter or other occupied dependency dating from the late eighteenth - early nineteenth century during an extensive investigation. All archaeological remains were found within the plow zone, meaning that the site had lost its integrity, and so was determined not eligible to the National Register, in consultation with the Virginia SHPO. Human remains had been uncovered at the site in April 1998, removed by the Suffolk police, and reinterred upon discovery that they were not from a recent crime. The remains were removed from the JRB bluff in June 2001 according to a plan approved by federal and state agencies and were sent to the physical anthropology laboratories at Radford University to determine the age and race. The remains were originally thought to be Native American, but were determined to be from the same time period as the site, and probably an African-American female. USACE Norfolk District is completing the Phase II archeological report. No further work is contemplated at this site.
- A removal action for the James River beachfront area from the bluff to the mean tide line was completed in October 2001. Plexus Scientific performed the removal action and revetment construction and is finalizing the report (ARF 01-13-082-v1). Ordnance scrap discoveries included bomb fins, 170-mm projectile shells and a cannonball (none of which were live). Soil testing results showed additional soil removal required to reach site cleanup levels in RBC document.

FUTURE WORK: A human health and ecological risk assessment of the site is planned to evaluate soils left in place beneath the revetment as well as soils at the bluff and to satisfy CERCLA requirements. The risk assessment will determine the level of further effort needed and if an RI/FS is required. A Proposed Plan and Record of Decision are required for this site. Further work in the area includes investigation of TCE in groundwater and investigation of the near-shore area metallic anomalies and possible other contamination. The TCE investigation will be discussed further under AOC-19. Off-shore and near-shore areas associated with the JRB will be discussed further under AOC A-3.

S-3. [OU-7] Impregnite Kit Area

SIZE: The Impregnite Kit area was previously 7 acres in size, and has been reduced to a circle approximately 300 feet in diameter covering 1.66 acres based on project team agreement (9 May 2002 Meeting Minutes).

LOCATION: The site is located to the south of the GE Plant on Dominion Lands, Inc. (DLI) property, in a wooded area with clearings.

HISTORY and PAST WORK: The site has earthen berms in several locations, and was used as a disposal area for the impregnite kits that had two components: XXCC3 powder and a viscous "syrup". Impregnite kits were used to impregnate undergarments of military issue chemical suits with the kit components for protection from chemical weapons. XXCC3 powder, white to cream colored and with a high chlorine content, was also disposed of in bulk in the area. These kits are not considered a Resource Conservation and Recovery Act (RCRA) Hazardous Waste as defined by the Material Safety Data Sheets.

- In March 1996, Malcolm Pirnie (DLI contractor) conducted a chemical screening and ordnance survey of the area. Anomalies were detected at depths greater than 3 feet. Excavation uncovered white powder in fiberboard containers, wooden crates, small metal cans, and fiber drums. Labels on containers identified the material as impregnating kit sets. In April 1996, Malcolm Pirnie sampled soil from the area to identify potential impacts related to the disposal practices.
- Roy F. Weston (USEPA contractor) excavated test pits in the area in April 1996, which indicated the presence of buried XXCC3 kits. Test pits were dug and samples were collected in an effort to delineate the extent of the disposal area. A Gannett Fleming visual site reconnaissance in July 1996 found XXCC3 kits and numerous small clumps of the white powder. Both Weston and Gannett Fleming conducted soil and waste sampling in February 1997 (referred to in ARF 01-13-031).
- In July 1998, 16 soil samples were collected by USACE Norfolk District and analyzed for full TCLP and RCRA characteristics. All material, including the pure impregnite powder were determined to be non-hazardous per 40 CFR 261.3
- In December 1998, 860 tons of soil containing impregnite material were removed and discarded in a solid waste landfill (ARF 01-12-002-v1).
- In July 1999, confirmation geophysical investigation and confirmation soil sampling was performed in the area. No further cleanup actions are required for this area. A final report was submitted to the state and federal regulatory agencies.
- The two outstanding issues raised by this investigation, (1) investigation of the source of a large anomaly found during the geophysical site work and (2) a high arsenic detection in a soil sample have been transferred to the Horseshoe Pond investigation efforts. This decision was confirmed by the project team during the Pre-RAB Project Delivery Team Partnering Meeting held on December 6, 2001.
- The AOC footprint was reduced to reflect the actual areas where the impregnite kit materials were found. The new area was delineated using historical photographs and investigation locations.

- The Impregnite Kit Area Report issued in October 2002 documented investigation of the anomalies. The geophysical anomaly was investigated and found to be non-OE materials. The analytical results were examined in detail, and the arsenic hit reported was determined to be a matrix spike result and not a sample result.

FUTURE WORK: The analytical data collected during the 1999 confirmatory sampling event has been validated, and a final close out report is being drafted. Further concerns with the site include groundwater issues which need to be resolved. Once these issues are resolved, the site will be closed out with a No Further Action (NOFA) Proposed Plan (PP) and Record of Decision (ROD) unless there is evidence of groundwater contamination or if no contamination, EPA chooses to directly go from the close out report to de-listing.

S-4. [OU-3] Horseshoe Pond Area

SIZE: The Horseshoe Pond AOC (HPA) is approximately 1.2 acres in size (ARF 01-05-006).

LOCATION: The HPA is located on DLI property, south of the GE Plant and west of the Impregnite Kit area, and close to the Nansemond River.

HISTORY and PAST WORK: It is suspected that the DoD services used this area to dispose of solid waste. Laboratory glassware, bottles, film, and assorted debris are visible in the vicinity of the pond. The area is also shown on 1955 site plats as having a Pistol and Small Bore Range over an approximate 400 foot by 600 foot area on the southeastern arm of the pond, overlapping the water. This property contains significant wetlands that preclude development.

- The Weston sampling event in November 1995 for the USEPA included two water and two soil samples from this area.
- In June 1996, Gannet Fleming visually inspected the area for the USEPA, finding the waste listed above. In 1996, a 30- by 30-meter grid at the north end of this area was surveyed by metal detector and a magnetometer. Twenty-four of the 36 anomalies detected were investigated and none were found to be Ordnance and Explosives (OE) related. However, during the survey for the anomaly investigation, two empty M-18 smoke grenades were found at the surface.
- Roy F. Weston is currently performing a Remedial Investigation in this area for the Corps of Engineers (ARF 01-05-008), which includes the Steamout Pond and Main Burning Ground areas. In February 1997, under the initial RI work plan, Weston collected pond sediment and surface water samples, dug test pits, and took soil samples.
- Zapata investigated the anomaly moved from the IKA to the Horseshoe Pond Area on 5-6 August 2002. A 52-foot radius circle drawn around the original coordinates was found to have numerous magnetometer signals which resulted in 31 contacts investigated and yielding 10 lb of non-OE scrap including wire, railroad ties, and pipes, with one contact yielding a single OE scrap item – an empty 20 mm projectile. Investigation results are documented in Zapata 4-10 August 2002 Weekly Report.
- The Project Team has agreed to include an elevated arsenic detection from the Impregnite Kit Area in the next phase of work at the Horseshoe Pond.

FUTURE WORK: Weston is preparing to conduct a Supplemental Remedial Investigation (SRI) for the Horseshoe Pond, Steamout Pond and Main Burning Ground Areas in September 2002. This SRI will complete the RI requirements under CERCLA, and the final documentation for the RI will include the recommendations for a Feasibility Study. Weston will also collect additional samples from the toe of the berm and the wetlands area behind the Horseshoe Pond to determine if these areas should be included in the Baseline Ecological Risk Assessment. Near-shore investigations in this area will only be done if sampling shows a pathway exists from the Horseshoe Pond to the river. This area requires on-site OE construction support during intrusive investigative activities. Once the SRI is completed, work in this area will proceed independently from the Main Burning Ground/Steamout Pond (23 July 2002 Meeting Minutes).

S-5. [OU-2] Main Burning Ground and Steamout Pond

SIZE: The Main Burning Ground AOC (MBG) covers almost 32 acres. The Steamout Pond (SPA) is contained within the Main Burning Ground and is approximately 1 acre.

LOCATION: The MBG is located along the south side of Wellner Drive (formerly Park Drive) on GE property.

HISTORY and PAST WORK: This site area is mostly wooded except for former railroad paths and periodic clearings in the tree canopy. The Main Burning Ground is also defined as NPL source area 5A and 5B, Park Drive Disposal Area, which refers to the historical road name. Historical photos show large areas of disturbance – clearings, pits, and vehicle tracks. A railroad track is seen leading to building number 336 on 1955 utility plats. A maintenance shop and a warehouse are also shown in the MBG area. Continuing investigations have found many burn and disposal pits that were used to burn, bury, and/or detonate ordnance and other scrap. Roy F. Weston is performing the remedial investigation under contract to the USACE Baltimore District.

- The OE EE/CA completed in 1996 identified trenches that may contain OE and OE-related items in an area with widespread scarring on historic photos (ARF 01-04-007-F).
- Weston (USEPA contract) conducted soil sampling in 1995 (ARF 01-13-012-F).
- Weston (USEPA contract) conducted soil/waste, sediment, and surface water sampling of this area in February 1997 (referred to in ARF 01-13-031).
- Gannett Fleming conducted soil sampling in February 1997 of the following: soil in the vicinity of distressed vegetation, pond sediment from the edge of the pond where a black, tar-like substance was found, soil from an area with large amount of scrap metal at the surface, and soil from an area where a ruptured 4.5" shell was found. Geophysical surveys, intrusive anomaly investigations, and test pits in the area in 1997 yielded ordnance items and scrap.
- Weston (USACE contract) installed new monitoring wells, sampled soil, water, and sediments during the remedial investigation in early 2000 (ARF 01-05-008).
- UXB International began an ordnance investigation and removal action under contract to USACE Huntsville in early February 2000. The removal action was completed for portions of the MBG owned by DLI known as the Dominion Lands I parcel. Work in the portions of the MBG now owned by G.E. and in the parcel known as Dominion Lands II began in October 2000, and is ongoing (ARF 02-01-013-F, ARF 02-01-015-F).
- In response to HTRW concerns of Huntsville USACE and UXB personnel during the ordnance investigation, the USACE Norfolk District has performed several screening level sampling events. The results of these events have not been published:
 - One hand-augured soil sample was taken from the trench in the MBG by the USACE Norfolk District. The soil had a strong petroleum smell and contained charred wood fragments as well as copper projectile tips. A sample from this

layer showed high levels of Diesel Range Organics (DRO). Other tests results were affected by the high DRO, so further testing is required to determine the exact nature of the contamination, in addition to further testing for delineation of the DRO.

- Shingles in construction wastes in another part of the MBG were sampled and tested by a USACE Norfolk District contractor for asbestos content.
- Other Potential HTRW issues in the MBG include the following areas which are described further in the HTRW Investigations section: Creosote, Grid E-3; Asbestos Piping, Grid G-15; Canister, Grid D-9; Sink top, Grid E-15.
- The MBG is the main ordnance removal work area. Ordnance investigation and removal by UXB International, now under subcontract to Zapata, is continuing through calendar year 2001 and will extend into 2002. Ordnance clearance investigations may extend beyond the current estimated MBG boundary as explosions may have ‘kicked out’ potentially hazardous materials into another part of the property. Further details of ordnance removals are in the Ordnance Removal section.
- Roy F. Weston, under contract to the USACE Baltimore, is currently performing an RI in this source area (ARF 01-05-008), with a second round of investigation and sampling to begin once ordnance clearance activities are completed. USACE Baltimore District and Weston are currently responding to comments to finalize the SRI.
- Data Validation Issues: On 4 April 2002, a meeting was held to educate site personnel on EPA Region III data quality and validation. Ft. Meade EPA data quality office personnel provided information on requirements and the project team discussed specific issues related to MBG results. (See Meeting Minutes and handouts).

FUTURE WORK: Weston is scheduled to conduct the SRI in September 2002. A special issue which impacts this area is the presence of both ordnance and potential HTRW contamination. The RI cannot be completed until the OE investigation/removal is complete. Any HTRW problem areas discovered during ordnance work must be addressed in the RI.

S-6. [OU-4] Track K Dump (Tire Pile and Paint Cans)

SIZE: The Track K Dump extended beyond the tire and paint cans to a 7-10 acre area. As described in the HRS, the tire pile was an area approximately 225 feet by 75 feet and the paint can area was 10 to 12 feet in diameter. The paint can pile was the only portion of the site quantified in the NPL calculations.

LOCATION: The Track K Dump AOC is located west of South Road on the TCC campus, in a wooded area which is currently unused by the college.

HISTORY and PAST WORK: The dump area was identified during a site visit. After aerial photographs were examined, the USEPA concluded that the materials were probably dumped in the area after DoD had transferred the property. Photos showed evidence of a dump site after 1964, but the ground had been disturbed along the Track K magazines during DoD ownership. Potential soil contamination may or may not have been a result from DoD usage at the former depot; therefore the tires were removed to access the soil under the pile. The tire pile contained a mix of automobile and truck tires, and to the south side of the tire pile, there was a pile of paint cans and possible paint thinner or solvent cans that appeared to have been burned.

- Weston took a soil sample from this area in February 1997 under a USEPA contract (referred to in ARF 01-13-031).
- A contract to apply the SSP to this area (location survey, aerial photograph examination), remove the tire pile and paint cans, and perform confirmatory sampling was awarded in January 2000. The work plan for the removal activities went to the regulatory agencies in April 2001, and a public notice regarding the plan was issued. Prior to removal activities, OE contractors performed a surface sweep of the area and flagged work areas as safe. The tire and paint can removal occurred between June 4 and June 18, 2001. The USACE contractor HydroGeoLogic removed and sent to a recycler approximately 58 tons of tires and disposed of approximately one half a cubic yard of paint cans (about two 80-gallon drums). The rest of the Track K area was investigated, and general debris (appliances, trash) was removed.
- The Virginia DEQ sent a letter stating that the tire pile was deemed closed out for their purposes. (ARF 04-01-010)
- Confirmatory sampling was performed as planned (ARF 02-01-019-F) in February 2002. Validated data will be used for the SSP once that document is finalized.

FUTURE WORK: A No Further Action Proposed Plan and ROD are planned for this area, providing the SSP shows no further site investigation is necessary. Investigation for the remaining area of the Track K Dump as shown on previous site figures is not required.

A-1. [POU-8] Nansemond River Beachfront

SIZE: The Nansemond River Beachfront Area (NRB) is approximately 90 feet long, with an additional 265 feet of beach area to the south that may have been impacted by waste from this area.

LOCATION: The NRB is located between the GE fence and the Nansemond River, and is TCC property.

HISTORY and PAST WORK: The NRB was listed as an AOC due to the presence of metal slag of questionable content. Evaluation of aerial photos indicates evidence of ground disturbance in the area, but it is not clear what the origin of the disturbance was. The NRB is adjacent to several former depot structures including a Wastewater Treatment Plant. Samples were taken in the NRB area as part of the 1998 EE/CA investigation (ARF 01-04-007-F).

During the week of 10 August 1999, the USACE met with Virginia DEQ and USEPA Region III to discuss the project status and establish and clarify site clean-up priorities. One of the outcomes of that meeting was prioritization of the FNOD AOCs. The Nansemond River Beachfront area was determined by group consensus to be the highest priority AOC.

- In September 1999, USACE repaired a fence restricting access to the NRB AOC and extended the fence to address USEPA concerns expressed in a memorandum dated September 10, 1999 (ARF 04-01-007).
- Since September 1999, the Corps of Engineers has performed several site visits to the area to determine if storm activity damaged the fence or resulted in other deteriorated site conditions. Between September and December 1999, no damage to the fence or deterioration of site conditions was noted.
- A contract was awarded to perform the SSP at this AOC. In November 1999, permanent survey monuments were installed to facilitate the Desktop Audit. Under a separate contract, the aerial photographs were rectified to the Virginia State Plane coordinate system.
- In December 1999, a USACE contractor moved the riprap to expose the known slag material. Gannett-Fleming performed sampling in the area in mid-January 2000 and a USACE contractor, MicroPact, Inc., split samples with Gannett-Fleming. The results will be used in the SSP.
- In 2001, the Plexus Scientific contract for the JRB was modified to add removal activities at the NRB. The visible debris was removed to an on-site container, characterized for disposal and disposed of as non-hazardous waste. No live OE was found, and the TCLP testing showed the material to be non-hazardous waste. Geophysical techniques were used to determine if below-surface slag remained, but were not effective in detecting all slag present. Some slag continues to surface as the slope erodes.
- The USACE will retain a contractor to visit the NRB at a minimum every other month and remove any pieces of slag visible. Removals will be documented in team partnering meetings. The material will be disposed of as non-hazardous waste. The

Norfolk District has evaluated erosion control measures and developed a conceptual stabilization plan.

FUTURE WORK: Due to the nature of the contamination at this AOC, the removal action was coupled with the SSP, and the confirmation sampling plan needs to be submitted to the project team and approved. The USACE Norfolk District will perform confirmation sampling, and the results will be used with previous results to recommend further actions for the site. The fines present in the slope, toe, and bluff, will be tested to support the Human Health Risk Assessment. Large pieces of slag will not be considered for the HHRA (9 May 2002 Meeting Minutes). A near-shore investigation is planned for this area if a source area is identified during the on-shore portion of the investigation – see the Near and Off Shore Areas section. Based on the latest EPA guidance concerning what is and is not part of the FNOD NPL site, a Proposed Plan and ROD will likely be required regardless of the screening results for the site.

A-2. [OU-6] Streeter Creek and Lakeview Drive Ground Scars

SIZE: This AOC covers approximately 4 ½ acres.

LOCATION: The Streeter Creek AOC is located east of I-664 and between Tracks A and B, along the western bank of Streeter Creek. It is also east of the Track A & B Burning Ground AOC (A-9).

HISTORY and PAST WORK: The area was discussed in the USACE Archives Search Report, the USEPA EPIC Study, and the Army USATEC Site Analysis Report (ARF 01-13-006-F, 05-01-003). Examination of aerial photos has shown ground scars present in this area and changes in buildings and standing surface water bodies throughout DoD ownership. Confirmed FNOD activities in this area include use of explosives magazines and outside storage of materials.

- A contract was awarded to MicroPact, Inc. to begin the SSP at this AOC. The draft Desktop Audit for this site was submitted to the USACE Norfolk District for internal review. MicroPact issued the final Desktop Audit in July 2002, which recommends groundwater, surface water, and sediment sampling (ARF 01-13-058-F).
- On September 20, 2001, USACE Norfolk District, USACE contractor IMS, and USEPA representatives investigated the object in the Streeter Creek area. It was determined to be a pontoon support structure with baffle and I-beam construction and may have been used to cross an arm of Streeter Creek. It was determined to not be of concern.

FUTURE WORK: The hydrological investigation conducted under the CSM will identify the relationship between site groundwater and the creek, which will help determine if the creek is actually a receptor or not. If the creek is determined to be a receptor, further assessment may be required. Additional sampling will be planned based on the desktop audit and hydrological investigations.

A-3. [OU-6] Near and Off-Shore Areas

SIZE: This AOC covers the entire shoreline of the FNOD, from Streeter Creek to Pig Point, encompassing the original and existing shorelines. It is approximately 2 miles long, with the original shoreline from 10 to 300 feet from the present shoreline based on examination of aerial photographs. Inland waters are defined as any landlocked bodies of water within the FNOD boundary.

LOCATION: The near-shore is defined as the area extending from land to the Mean Lower Low Water (MLL) mark. Near-shore areas will be investigated in conjunction with the corresponding source area/area of concern (9 May 2002 Meeting Minutes). The off-shore is defined as the area from MLL out to open water, with the extent to be determined.

HISTORY and PAST WORK: The off-shore area is of concern for several reasons. The first reason is possible OE around the site piers. Two piers, one of which was over a mile long, were constructed at the depot for transfer of ordnance between ships and land. Historic records document at least one fire on the mile-long pier and state that ordnance materials were dumped into the water in response to the fire. Other accidental or intentional dumping may have occurred off the piers. Another concern is the appearance of waste materials – metallic slag, construction and general debris, and ordnance scrap at two or more locations at the site where significant erosion of the shore has occurred. This erosion exposed previously inland dump areas to wave action, uncovering debris and washing it into the river. A third reason for concern is possible transport of contaminants, as surface runoff and groundwater may drain into the offshore areas. Survey boats limited to deeper water offshore effectively split the offshore area into near-shore (directly off the beachfront areas, in tidal zones) and off-shore (open water) areas. Specific areas have been investigated, and an overall survey has been done:

- Sediment samples have been taken in various areas by USEPA and USACE contractors.
- Navy divers explored the area around the Mile Long pier pilings in 1999. No ordnance or hazardous items were discovered at that time.
- In December 1999, a contract was awarded to SAIC to begin the SSP of the offshore area adjacent to the JRB. Work included collection of geophysical data, sediment and water samples. Final findings and screening level ecological risk assessment reports were issued July 2001 (ARF 01-13-064 and 01-01-055).
- An agreement was also established between the USACE and the U.S. Fish and Wildlife Service (FWS) to perform a habitat survey and some tissue sampling of resident organisms in this AOC. Initial samples were taken. Additional funds will be used to assist USACE efforts.
- Items identified as possible ordnance off the Monitor-Merrimac Bridge were investigated by the USACE Norfolk District with Navy EOD divers in June 2001. After a five-day effort, during which extensive metal, fishnet, and concrete debris was found, the Navy concluded that there was no ordnance in or near the reported location.
- The World War I and World War II piers will be evaluated as part of this AOC.
- The offshore areas at the James River Beachfront, Streeter Creek, and Nansemond River Beachfront were determined to be the highest priority during the Ecological Risk

Assessment Meeting held June 2001 at the USACE Norfolk District (the meeting minutes will become part of the ARF and will be referenced as such in the next version of the SMP).

- Additional sampling was completed in late Spring 2002 for the offshore BERA effort by SAIC after approval of the workplan addendum by the USEPA.

FUTURE WORK: A contract has been drafted for near-shore investigation of the JRB and the fishing pier. A near-shore investigation is planned for the NRB if the on shore investigation determines the site is in fact a potential source area. Sampling is planned for the wetland area behind Horseshoe Pond. If this sampling shows a pathway exists between the Horseshoe Pond and the river, and the Horseshoe Pond is determined to also be a potential source area, then a near-shore investigation will be conducted. Future work in Streeter Creek will be determined based on the results of the hydrological investigation. Off-shore: the risk analysis will not need direct human exposure analysis, only fish tissue exposure (9 May 2002 Meeting Minutes). A No Further Action Proposed Plan and Record of Decision are planned for the Far-Offshore work.

A-4. [OU-6] GE Pond/Nansemond Culvert

SIZE: The GE Pond is approximately circular with almost 1 acre of surface area and the culvert is located approximately 1500 feet from the pond (estimated distances from site figures).

LOCATION: The GE Pond is located on GE property southeast of the plant and Wellner Drive and west of the MBG area. The Nansemond Culvert, also on GE property, is on the Nansemond River northwest of the plant, between the Horseshoe Pond and the former wastewater treatment plant. The culvert is concrete and is protected by a fence.

HISTORY and PAST WORK:

- In February 1997, under contract to USEPA Weston collected samples of sediment and surface water from the pond, discharge from the culvert and sediment from the river near the culvert outfall (referred to in ARF 01-13-031).

FUTURE WORK: The Desktop Audit for this area is scheduled to start first quarter of FY03 (October 2002). USACE is seeking additional information on a removal action by GE at the pond, as well as past sampling done by USEPA contractors.

A-5. [OU-6] Tidewater Community College Lake

SIZE: The Tidewater Community College (TCC) Lake is approximately 2500 feet long and 500 feet wide at its widest point. The TCC Lake AOC extends slightly beyond the lake itself, including the bank and nearby woods.

LOCATION: The TCC Lake is located north of College Drive on the TCC campus.

HISTORY and PAST WORK: The TCC Lake was located in the middle of the former depot, effectively splitting it into eastern and western portions (utility plats from the 1950s are split into east and west). The TCC Lake has been used as a surface water source, and an old water treatment plant and storage tower are located to the south, near Club Drive. The location and common historical uses of surface water bodies as convenient dump areas resulted in the lake being subject to several investigations:

- USACE performed a visual survey of the TCC Lake area in November 1993. Construction debris and railroad ties were found in an excavated hole along the eastern edge of the pond, but no evidence of munitions disposal was observed (ARF 01-13-007).
- Roy F. Weston performed multimedia sampling in November 1995 around the lake (ARF 01-02-001).
- Another visual site inspection in January 1996 by Gannett Fleming, Inc. was limited to a small portion of the pond due to dense vegetation (ARF 01-02-002).
- Roy F. Weston sampled sediment and water from the lake in February 1997 and Gannett Fleming sampled sediment and water from the lake in September 1997 for the USEPA (ARF 01-13-072). Based on magnetic and visual surveys of the lake shore in 1997, no anomalies or potential UXO items were detected.
- A contract was awarded to begin implementation of the SSP at this area of concern. The initial report for this effort was submitted to the USACE for internal comments. Historical data need to be analyzed in more detail to finalize this report.
- The desktop audit was finalized by USACE Norfolk District contractor Micropact.

FUTURE WORK: The Virginia DEQ plans to issue a report on fish tissue sampling. Recommendations for sampling efforts contained in the Desktop Audit will be considered for the next step in the SSP, and a work plan will be developed.

A-6. [POU-10] Marine Corps Power Generation

SIZE: This AOC is limited to the former power generation facility and fuel storage tank area.

LOCATION: This AOC is located northeast of the intersection of Armistead Road and College Drive.

HISTORY and PAST WORK: This AOC was the site of a generator building in which the electric turbines used diesel fuel for power.

- A Norfolk District contractor removed a 12,000 gallon aboveground storage tank from the site in 1999 (ARF 01-13-041) to address USEPA concerns expressed in a memorandum dated February 11, 1999 (ARF 04-01-007). Soil from under the tank was tested.

FUTURE WORK: To be determined. A transformer possibly containing PCB-contaminated oil reportedly remains on site.

A-7. [OU-6] Area J Lake and Possible Burning Ground Area

SIZE: The lake is approximately 650 feet by 350 feet, and the AOC includes the land inside the u-shaped lake and the woods surrounding the lake.

LOCATION: The J-Lake is located between I-664 and Streeter Creek and is southeast of the James River shoreline.

HISTORY and PAST WORK: Concerns in this AOC include evidence of ground scarring, clearing or grading, and mounding of materials

- A geophysical survey was performed in this area in 1997 as part of the ordnance EE/CA. 22 of 57 anomalies were investigated, but none were determined to be OE related (ARF 01-04-007-F). The site was determined to not be a potential OE site (only on-call support required during site work) (6 Jun 2002 Meeting Minutes).
- A contract was awarded to begin implementation of the SSP at this area of concern. The contract was designed to address the Streeter Creek AOC, TCC Lake and J Lake together due to their potential hydraulic connection with the surficial aquifer.
- The desktop report was finalized by the USACE Norfolk District contractor Micropact in Spring 2002.

FUTURE WORK: Recommendations for sampling efforts contained in this report will be considered for the next step in the SSP, and a work plan will be developed.

A-8. [POU-11] Track A - Explosive Magazine Line (Disposal Pit)

SIZE: Unknown.

LOCATION: The Track A Disposal AOC is located east of I-664, immediately south of the Track A&B and Streeter Creek AOCs.

HISTORY and PAST WORK: The eastern portion of this AOC is suspected to be a solid waste disposal area based on mounding and ground scars, identified in aerial photography, near the former explosive magazines.

- The 1997 geophysical survey in this area resulted in 62 anomalies. 40 were investigated and none were found to be OE related items (ARF 01-04-007-F).

FUTURE WORK: To be determined.

A-9. [POU-11] Track A & B Burning Ground

SIZE: Unknown.

LOCATION: The AOC is located immediately east of I-664 near the Armistead Road overpass, to the south of the J Lake area and directly north of the VDOT yard.

HISTORY and PAST WORK: Aerial photographs revealed a ground scar in the proximity of Track A&B. Previous use of the site probably included burning of ordnance and TNT.

- Weston (USEPA contract) collected one soil sample in 1997 from this area in February 1997.
- A 1997 geophysical survey during the OE EE/CA work resulted in the detection of eight anomalies that were investigated and none were OE-related (ARF 01-04-007-F).

FUTURE WORK: To be determined.

A-10. [POU-9] Track G Explosive Magazine Line (Scars)

SIZE: Unknown.

LOCATION:

HISTORY and PAST WORK: This AOC has not yet been investigated. At this time, no further information is available on this AOC.

FUTURE WORK: To be determined.

A-11. [POU-9] Track H and I Explosive Magazine Line (Scars)

SIZE: Unknown.

LOCATION: Tracks H and I are located to the east of the TCC Lake near the JRB.

HISTORY and PAST WORK:

FUTURE WORK: To be determined.

A-12. [POU-11] Track J Explosive Magazine Line (Scars)

SIZE: Unknown.

LOCATION: Track J is located west of I-664 near the JRB.

HISTORY and PAST WORK: At this time, no further information is available on this AOC.

FUTURE WORK: To be determined.

A-13. [POU-10] Unknown Abandoned Structures near WWTP

SIZE: This AOC is limited to only the structures between Shore Drive and the Nansemond River.

LOCATION: The abandoned structures are located to the northwest of the GE plant on the Nansemond River. The project delivery team determined that this AOC would include the labs and plant buildings on August 16, 2001 (see meeting minutes).

HISTORY and PAST WORK: At this time, no further information is available on this AOC.

FUTURE WORK: To be determined.

A-14. [POU-9] Track K Explosive Magazine Line (Scars)

SIZE: Unknown.

LOCATION: Track K is located on the west side of the TCC Lake.

HISTORY and PAST WORK: This area has been designated Area H-1, H-4 in the HRS.

- The 1997 geophysical survey for the OE EE/CA yielded 32 anomalies, 25 of which were investigated, but none were found to be OE-related (ARF 01-04-007-F).

FUTURE WORK: To be determined.

A-15. [POU-9] Track K- Explosive Magazine Line Landfill

SIZE: Unknown.

LOCATION: The Track K Landfill is located to the south of Shore Drive, west of the TCC Lake.

HISTORY and PAST WORK: This area was previously designated Area H-5. At this time, no further information is available on this AOC.

FUTURE WORK: To be determined.

A-16. [POU-11] Removed Steam Heating Plant

SIZE: Unknown.

LOCATION: The steam plant was located at the northwest corner of the College Drive and Park Drive intersection.

HISTORY and PAST WORK:

- In May 1991, a Site Survey Summary Sheet for the DERP-FUDS investigation described the presence of three 25,000 gallon abandoned underground fuel tanks, piping, and equipment which contained free product.
- Tidewater Community College removed the steam plant in 1993.
- In December 1994, the USACE removed three (3) 25,000-gallon underground storage tanks (USTs) associated with this building (ARF 01-13-008).

FUTURE WORK: The SSP will be done for this site. The Desktop Audit will include documentation of the coordination with the Virginia DEQ UST program personnel during the UST characterization and removal.

A-17. [POU-10] PCB Transformer Removal

SIZE: Unknown.

LOCATION: Unknown.

HISTORY and PAST WORK: Unknown.

FUTURE WORK: To be determined. A Desktop Audit is required to provide background on this area. At this time, no further information is available on this AOC.

A-18. [POU-10] Suspected Underground Storage Tanks

SIZE: Unknown.

LOCATION: The suspected USTs are on active portions of the TCC campus, in open areas.

HISTORY and PAST WORK: At least two large anomalies that appear to be underground storage tanks were discovered during the geophysical anomaly investigation.

- One of the supposed USTs is located at the western end of the original TCC athletic fields.
- The second supposed UST is located in the western portion of the truck driving school area, and was previously described as a concrete structure, roughly rectangular, wider at the bottom than at the top. UXB investigated the structure during the anomaly investigation, and USEPA investigated this possible UST with the conclusion that the concrete structure was a foundation for a blast wall, which explains the size and shape of the concrete (report by Harry Wheeler for EPA).

FUTURE WORK: The suspect UST in the truck driving school area is removed from the site list of concerns based on the USEPA contractor's report. The need for further investigation of other suspected USTs will be determined.

A-19. [POU-?] TCE Contamination Adjacent to the James River Beachfront Area

SIZE: Unknown.

LOCATION: Vicinity of James River Beachfront monitoring wells.

HISTORY and PAST WORK: Low levels of TCE were discovered in some of the monitoring wells adjacent to the James River beachfront source area. In the first round of sampling, a qualified result exceeded the drinking water MCL of 5 ug/L. Regulatory limits have changed and the current (April 2002) Region III RBC for tap water for TCE is 0.026 ug/L.

- In the first round of sampling, done by USACE Baltimore in January 1998, MW-01 had a result of 2 ug/L and MW-02 had a result of 6 ug/L, both J-qualified as the reporting limit at the time was 10 ug/L. Blanks and other well samples (MW-04 and MW-05) were non-detect.
- In the second round of sampling, in June 1999 by Weston (USACE contractor), MW-01 and MW-01 duplicate sample both had a result of 0.3 ug/L, J-qualified, with a reporting limit of 1 ug/L. All blanks and other well samples were ND.

FUTURE WORK: Site data does not conclusively show that there is a TCE problem at the JRB. Changes to the analytical method in past investigations, including method detection limits, and inconsistent results add to the uncertainty of the data. Further investigation is required to determine if TCE truly exists at the site at levels above the regulatory limit. USACE will be installing an upgradient well and performing additional rounds of sampling to determine if there is TCE at this site. Agreement between these two sampling events, and repeated non-detect results would show that TCE is not a contaminant of concern in this area, and the AOC will be removed from the AOC list. If TCE is consistently detected in the monitoring wells over the next 4 quarterly sampling events, then USACE will initiate an RI to delineate the extent of the TCE contamination.

A-20. [POU-10] Abandoned Water Treatment Plant near Building H-413

SIZE: This AOC is the area immediately surrounding the standing million-gallon water tank and the pump building.

LOCATION: North of Club Drive, between the road and TCC Lake, to the east of the access gate at College Drive.

HISTORY and PAST WORK: The abandoned water tower is still standing at the site. The building nearby which is also still standing is designated H-413 on site utility maps from 1955 and appears to be the pump station. Other structures are associated with these two structures on the utility plats. Concerns include possible USTs which would have supplied the pump station generators. At this time, no further information is available.

FUTURE WORK: Sampling for this area may be included with the investigation for TCC Lake. The TCC Lake Desktop Audit recommended sampling in the area of the abandoned plant.

A-21. [POU-9] Officer's Pool Chlorine Containers

SIZE: This AOC is limited to the disinfection facilities at the pool.

LOCATION: The Officer's Pool was located in the center of the depot to the west of the intersection of East Road and Merrimac Avenue. The pool is directly behind the paved area used by the USACE for contractor trailers.

HISTORY and PAST WORK: The pool was used by several property owners subsequent to DoD control of the FNOD, and it is unknown when the pool was removed from service. This site was added to the AOC list in 2001 (16 August 2001 Meeting Minutes) due to concerns that potentially hazardous chlorine containers utilized by the DoD were left underground.

- USACE and EPA contractors investigated the area. It was determined that TCC would remove tanks and chemical drums (pool chemicals) before this is removed as an AOC based on an agreement with project team members (Reference?).

FUTURE WORK: Once TCC removes chemicals from the building, this area will be removed from the AOC list. (9 May 2002 Meeting Minutes).

Other Relevant Investigations and Activities

Land Use Control Implementation Plan

Land Use Controls (LUCs) to manage the existing risk and any possible post-removal risk from Ordnance and Explosives (OE) were an integral part of: (1) The 1998 Final Engineering Evaluation / Cost Analysis for Ordnance and Explosives at FNOD, (2) The May 1999 Action Memorandum for non-time-critical OE removal actions at FNOD, (3) The May 1999 Technical Memorandum signed by the Army and the USEPA, and (4) The December 1999 Former Nansmond Ordnance Depot Interagency Agreement to Perform a Time Critical Removal Action for Ordnance and Explosive Safety Hazards. The project team has agreed that residential use assumptions will be used for risk analysis even where future use is non-residential to justify or avoid LUCs (9 May 2002 Meeting Minutes).

Work developing the appropriate LUCs for the FNOD began in mid-2000. A Land Use Control Work Group meeting and presentation to the RAB were conducted in December 2001. Detailed feedback from landowners was obtained by questionnaire and interview, then analyzed by a USACE contractor. During 2001, a Land Use Control Assurance Plan (LUCAP), Land use Control Options Paper (LUCOP, Risk Management Strategy Report, and Land Use Control Implementation Plan (LUCIP) were developed. The USEPA initially requested that USACE produce a Proposed Plan and an Interim Remedial Action Record of Decision for LUCs at FNOD, but agreed in December 2001 to the LUCIP process as long as Memoranda of Agreement between the major stakeholders could be put in place by mid-2002.

In 2002, progress included the following:

- LUCIP: completed public review. The responsiveness summary has been produced. The document was signed by the Norfolk District Commander on 20 August, 2002.
- The first MOA with the City of Suffolk is in negotiations. Upon completion, USACE will start negotiations with individual landowners.
- Once MOAs are completed, the USACE plans to discuss the use of Miss Utility as a means of providing future land disturbing entities notification of the status of the property. The USACE would act as a utility or municipality and receive notices when a potential action will occur within the site footprint.

Removal Action Area 1: TCC Geophysical Anomaly Investigation

In May 1999, the USACE Norfolk District and USEPA Region III signed a Technical Memorandum. The purpose of the Technical Memorandum was to address concerns USEPA had regarding the potential for unexploded ordnance (UXO) on TCC Property at five AOCs. The technical memorandum is included as an appendix to the IAG addressing the Time Critical Removal Action (ARF 01-08-005). The AOCs are listed below along with the associated rationale for conducting additional investigation.

- 1) TNT Removal Area – Several Hazardous, Toxic, or Radioactive Waste (HTRW) and OE removal actions were conducted previously in this area. For this investigation, the study area was enlarged beyond what was previously studied to ensure any other disposal in the area would be detected.
- 2) Athletic Field (South and North) – Based on the terrain of this area, it was included in the geophysical survey.
- 3) Renovation Plant Area - This area was used to renovate shells.
- 4) Buildings L-11 and L-12. - These magazines were destroyed by fire in the 1920s.
- 5) Building E410 - This magazine was destroyed by fire in 1937.

On May 24, 1999 a verbal notice to proceed was provided to Science Applications International Corporation (SAIC) to begin geophysical anomaly investigation at the TNT Removal Area, the FNOD Former Athletic Field Area and the FNOD Renovation Plant area. This contract was awarded to address USEPA concerns that UXO may exist in areas not fully investigated under the Ordnance and Explosives Final Engineering Evaluation/Cost Analysis FNOD (ARF 01-04-007-F). The five areas were divided into heavily trafficked areas and remote areas to simplify programming issues. The results of the investigation of the first three sites are summarized in the Final Field Report for Geophysical Survey at the FNOD dated November 1999.

Investigation of the geophysical anomalies discovered in the first three areas began in January 2000. Investigation and removal will be performed per the Final Work Plan for Ordnance and Explosive (OE) Removal Action prepared by UXB International, Inc. for the USACE Huntsville (ARF 02-01-015-F).

In October 1999, a second contract was awarded to SAIC to complete the geophysical investigations around former buildings L-11, L-12 and E-410. Preparations for the geophysical investigations began in early December 1999. The geophysical investigation was completed late summer, 2000, and investigation and removal by the ordnance contractor, UXB International, are still occurring at the time of completion of this report.

Background Study

The USACE Baltimore has contracted with Roy F. Weston to perform the soil and groundwater background study for the site. Twelve surface and twelve vadose zone samples were taken between November 1999 and April 2000 on DLI and TCC property determined to be outside the influence of FNOD site activities. The draft report was issued November 2000 (ARF 07-03-009). An explosives compound was detected in one of the background samples, and an additional sampling event of six borings surrounding that previous detection was conducted in June 2001 by Micropact to determine if the detection was a true detection or possible laboratory contamination. All the additional samples were non-detect for explosives compounds. Comments from USEPA and Virginia DEQ have been addressed by the USACE and Weston and responses were issued late in 2001. An additional 12 background samples were collected by AH Environmental in January 2002 following Weston's recommendations for additional metals sampling. The USACE agreed to include a 95% UTL table in the document (9 May 2002 Partnering Meeting minutes). Validation is complete for the additional sampling and the

document has been submitted to USACE for internal comments (end July 2002). The draft document was submitted to regulators in August 2002.

Pesticide Drum Area

The two empty drums found in the TCC Parcel 1 area were removed in June 2001. An initial screening sample was taken from the surface directly under the capped drum. Confirmation sampling was performed February 27, 2002, in conjunction with sampling at the Tire and Paint Can Pile. Results were validated and will be evaluated against screening values once the Background Study is completed. It is expected that the area will need no further work.

Hydrologic Conceptual Site Model

The hydrologic conceptual site model (CSM) is being developed to provide accurate information about groundwater flow and possible transport in groundwater and surface water of site contaminants to receptors. Refinement of the CSM for groundwater flow is required to support investigative efforts for the overall FNOD site and for specific areas. Data required for the hydrologic CSM includes groundwater elevations and contaminant concentrations, surface water elevations, soil types, and soil properties required for modeling flow. Tidal influence must also be evaluated due to the location of the FNOD site.

Existing information, including well data, was examined to determine where data gaps exist. Water table elevation data from several sampling events was processed using GIS software and flow diagrams were produced. These diagrams for several events showed the following:

- On the west side of the site, groundwater flow occurs from the FNOD boundary along the south (in Dominion Lands property) towards the Nansemond River to the west and to the James River to the north. Groundwater flow in the center of the site is indeterminate.
- Groundwater flow towards TCC Lake has an unknown fate.
- On the east side of the site, the relationship between groundwater and surface waters, including Streeter Creek, is still unknown.

More frequent water level monitoring and additional wells were needed in several areas to address the above data gaps. The USACE Norfolk District has performed water level surveys every quarter since early 2001 to include in a water level database. Three new well clusters (at J-Lake, on the north-western portion of the FNOD, and to the east of Streeter Creek in the Respass Beach neighborhood) and an additional single well (at the James River Beachfront area) were installed in August-September 2002 to provide groundwater information where data gaps exist. Soil samples were collected during the borings and analyzed for geotechnical parameters. The wells were developed and sampled for the full suite of analyses used at FNOD.

Communication between the surface water bodies will be estimated using relationships of surface water level fluctuations and groundwater level fluctuations. To aid in this determination, the USACE has installed staff gauges at the Nansemond River, the James River, Streeter Creek, TCC Lake, and the J-Area Lake. Staff gauge readings are collected quarterly by the USACE Norfolk District along with monitoring well level surveys.

The Residential Well Sampling may be used to provide additional information on site hydrology, specifically if site contaminants have migrated past Streeter Creek. This sampling is discussed below.

The hydrologic model development has continued with information gathering at the same time as the well drilling and water sampling. The data collected will be used for model development as needed, and the model will be updated as necessary.

Residential Well Sampling

Due to the proximity of the Respass Beach neighborhood to the site (located directly east of Streeter Creek which formed the former depot boundary), and due to the fact that the neighborhood utilizes individual and group groundwater wells, there have been concerns that site contaminants may reach human receptors through groundwater use. Two previous sampling events of residential water have occurred (one of which was a resample of previous analytes). An additional residential well sampling event occurred in April 2002. The purpose of the sampling event was to address the concern of potential off-site migration of contaminants from the FNOD site into the groundwater used by nearby residential wells. For the event, eight locations were selected for sampling to represent the deep and shallow aquifers as well as to provide a distribution over the neighborhood area.

Due to drinking water well construction and the sampling data objectives, drinking water sampling methods were coupled with analytical methods normally used with monitoring well samples. In order to provide more accurate groundwater information, this sampling will be supplemented by sampling of the new monitoring well clusters, including one constructed east of Streeter Creek on one of the residential properties in the Respass Beach area.

There were no detections of FNOD-related contaminants in the residential well water, however detections of MTBE, nitrates, fluoride, and sodium were above MCLs. The Virginia DEQ Tidewater Regional Office initiated an investigation into the one location where MTBE was detected and offered the residents an alternate water source, which the residents declined. The detections of sodium and fluoride were within regional aquifer normal levels, but residents were notified of the high levels. The location which had the nitrate exceedance also was determined to have other localized water quality problems, which the resident is already aware of.

The sampling followed a team approved work plan (ARF 02-03-018) and data was validated in June 2002. A report will be submitted to the project team in 2002 with more detail on the sampling results. Risk analysis will not be required on the residential well data unless FNOD related issues are found in the sample results (9 May 2002 Meeting Minutes). The project team has been informed by the City of Suffolk Health Department that the City has approved extending water and sewer service to the area and this should be implemented in the next two to three years.

8. POTENTIAL HTRW/DIG SHEET ITEMS

A March 2, 2000 letter from the EPA to the USACE noted that many of the dig sheets produced during ordnance investigations at the site described other non-ordnance items which may be of concern. The items identified on dig sheets as described in the above letter will be investigated and added as AOCs or incorporated into existing studies if they show a possible hazard. Some of the items have already been investigated, and others have investigations planned during further RI work (as in the Main Burning Ground).

As ordnance contractors discover potential HTRW at the site during their removals, the USACE Norfolk District Technical Manager will be contacted. The Technical Manager will arrange for investigation, will document new items as they are uncovered and attempt to investigate them before the contractor leaves the site. USACE or contractors will immediately take screening level grab samples and analyze by methods appropriate for the apparent contamination.

All past dig sheets will be reviewed for questionable items. In order to track these items, Table 8.1, Potential HTRW Concerns, will be maintained in this plan. Table 8.1 shows item description, location (descriptive and x-y coordinates, if available), and resolution of each questionable item found.

Table 8.1: Potential HTRW Concerns

Item Name	Area/Grid	Date Found	Resolution	Resolution Date
Pits 15 and 19	Soccer Field	14 Feb 2000	Soil samples showed no contamination except for two samples with solidified tar chips of the material had high PAHs. Digging resumed in the pit with general debris found and removed (Norfolk District files). No OE was found. Virginia DEQ considers debris at site 'construction debris' and a solid waste issue.	Final decision?
MBG Trench	MBG/ D-2	Late 2000	UXB stopped digging in trench due to fuel odors. Two samples (3/2/2001) of trench material showed diesel range hydrocarbon contamination and possible pesticide contamination. Approx. 16" below the surface (bottom of trench) is 5" burn layer (wood with copper projectile tips) (sample MBG-TR1) and very strong petroleum smell, sand layer (MBG-TR2) also strong smell. Requires further delineation.	Not yet resolved.
Creosote	MBG/E-3	15 Dec 2001	Material tested – PAHs present indicate creosote. Site visit with Virginia DEQ TRO rep. 6 Mar 2002. Virginia DEQ issued letter regarding waste June 2002.	?
Asbestos Shingles	MBG /	?	Shingles were tested and found positive. Were hand-removed, double-bagged and disposed.	?
Asbestos Piping	MBG / G-13	8 Nov 2001 (?)	Reactivities Management personnel examined pipes, sampled insulation and sent sample to lab for analysis. Material was positive for asbestos. A licensed asbestos removal company was contracted, and 22 bags of asbestos waste were removed and disposed as non-hazardous waste.	12 Nov 2001 (removal) 27 Nov 2001 (excavation backfilled)
Cylinder	MBG / D-9	?	Reactivities Management personnel investigated item and determined it to be a 'hydraulic accumulator', non-hazardous and non-OE. Item was cut in half and disposed of as trash.	29 Jan 2002
Sink Top	MBG / E-15	May 2002	Samples were taken under where the sink top was found and PAHs were found. Soil was recommended to be removed from site in roll offs once disturbed	?

9. ORDNANCE CLEARANCE ACTIVITIES

Ordnance clearance activities began at the FNOD after the discovery of solid crystalline TNT at the TCC campus in 1987. The ordnance clearance continues to be the largest line item in the FNOD budget.

- Original OE sites included the TCC Retention Pond to the east of the Beazley building, the James River Beachfront, and the area where the crystalline TNT was found.
- Huntsville AEC oversaw completion of an Ordnance EE/CA in 1998 (ARF 01-04-007-F) which detailed recommendations for the treatment of the various FNOD site areas.
- The USACE and the EPA signed a Time Critical Removal Action (TCRA) agreement in January 2000 (ARF 01-08-005). This TCRA required geophysical investigation and ordnance removal in five site areas. Norfolk District contractors performed a geophysical survey, and UXB, under contract to Huntsville, investigated the anomalies found by digging holes and pits and removed ordnance where necessary. Sites found to be non-OE sites under this investigation included the L-11/L-12 building areas and E-410 building area. Sites where OE was found under this work included the North and South Athletic Fields and the TNT Area (which included the soccer field for the investigation scope.) Due to possible HTRW issues and other scope of work problems, several pits were left unfinished.
- Huntsville contractor UXB has been on site and working at the five TCRA areas, and other sites yielding OE: the MBG (Dominion Lands and GE properties), and the Horseshoe Pond areas since late 1999.
- The HTRW and contract issues for the remaining pits (including 12, 15, 18, and 19) have been gradually addressed, and the final pit, Pit 18, was completed May 2002. However, magnetic anomaly removal continues in the area of Pit 18 since a number of adapter boosters, 62 lbs of 30 cal ammunition, and 108.5 pounds of crystalline TNT were found in the area adjacent to Pit 18 coincident with the original TNT area. Crystalline TNT will be removed if located during the ongoing magnetic anomaly investigation. Any remaining TNT in the soil will be dealt with during the TNT Area HTRW investigation.
- Current clearance activities are being performed by Zapata Engineering, with UXB International as a subcontractor. Huntsville work plans cover the GE MBG, the Pit 18 / TNT area, and any other areas requiring construction support.

Total ordnance found is shown in Table 9-1, FNOD Ordnance and Explosives Removal Summary (next page).

Table 9.1: FNOD Ordnance and Explosives Removal Summary, as of 09/15/02

DATE	AREA	UXO ITEMS	OE ITEMS	MISC MUNITIONS POUNDS	BULK EXPL POUNDS	OE SCRAP POUNDS	NON-OE SCRAP POUNDS	CONTAM. SOIL POUNDS	Comments
									Pre 2000 OE may have been in part or whole OE Scrap
1975	TCC Shoreline		500		3000				Items recovered by Navy during initial and follow up response
1987	TNT Area		19	6930	5270		440	30275	includes several ton slab of crystalline TNT (5000lbs)
1992	TNT Area		2					190000	15 tons of bullet laden soil plus 80 tons of lead laden soil
1992	JRB		12						Navy EOD - 12 155mm
1992	JRB		5						Army EOD - 5 155mm
1993	JRB		6						Army EOD - 6 German 170mm
1994-96	TCC Retention Pond					31450			Initial discovery 1994, major removal 1996
1996-97	Main Burning Ground		6						discovered and removed during EE/CA surveys
1996-97	Horse Shoe Pond		2						" "
1996-97	TDD Retention Pond		1						" "
1998	Impregnite Kit Area							1720000	860 tons of impregnite removed from source area 3
1999-01	Pits and Trenches		408		1	157	1956		
1999-01	Dominion Lands 1		127			110	2296		
1999-01	Dominion Lands 2		66			586	2700		
1999-01	L-11 / L-12 / E410		0				214778		
1999-01	Main Burning Ground		194			13808	135826		
1999-01	JRB		0						
2001-02	Main Burning Ground		153			4724	143049		
2001-02	Pits and Trenches		454		0.3	6175	18328		Pit 12
2001-02	TNT Area		14			171	319		Grid adjacent to Pit 18
2002-pres	Main Burning Ground		40			300	79108		Includes one item from HSP
2002-pres	Dominion Lands 1/2		8			37	4380		
2002-pres	TNT Area		139	62	108.7	166	17335		Pit 18 / TNT Area
TOTALS		UXO ITEMS	OE ITEMS	MISC MUNITIONS POUNDS	BULK EXPL POUNDS	OE SCRAP POUNDS	NON-OE SCRAP POUNDS	CONTAM. SOIL POUNDS	
			2156	6992	8380	57684	620515	1940275	

10. ACRONYMS AND ABBREVIATIONS

ADNT	2-amino-4,6-dinitrotoluene (2-A-4,6-DNT); 4-amino-2,6-dinitrotoluene (4-A-2,6-DNT)
AOC	Area of Concern
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirement
ARF	Administrative Record File (number)
ASR	Archives Search Report
AWP	Archaeological Work Plan
BTEX	benzene, toluene, ethylbenzene, and xylene
cfs	cubic foot per second
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CPW	College Production Well (on TCC campus)
CSM	Conceptual Site Model
CWM	Chemical Warfare Material
DERP	Defense Environmental Restoration Program
DEQ	Department of Environmental Quality
DLI	Dominion Lands, Inc.
DNB	dinitrobenzene
DNT	2,4-dinitrotoluene; 2,6-dinitrotoluene
DoD	Department of Defense
Edge	Edge Group
EE/CA	Engineering Evaluation/Cost Analysis
EGIS	Environmental Geographic Information System
EOD	Explosive Ordnance Disposal
ERT	Environmental Response Team (USEPA)
FNOD	Former Nansmond Ordnance Depot
FUDS	Formerly Used Defense Sites
FWS	US Fish and Wildlife Service
g	gram
GE	General Electric
GMS	Groundwater Modeling System program
HMX	High Melting Explosive (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazine)
HPA	Horseshoe Pond AOC
HRS	Hazard Ranking System
HTRW	Hazardous, Toxic, and Radioactive Waste
IAG	Inter-Agency Agreement
IKA	Impregnite Kit AOC
JRB	James River Beachfront AOC
kg	kilogram
L	liter
MBG	Main Burning Ground AOC
mg	milligram
mi	mile
MSL	mean sea level
MW	monitoring well
N/A	not applicable
NA	not analyzed

ND	not detected
NE	not evaluated
ng	nanogram
NL	not listed
NOFA	No Further Action
NPL	National Priority List (Superfund)
NRB	Nansemond River Beachfront AOC
OE	Ordnance and explosives
OEW	Ordnance and Explosives Waste
O&M	Operations and Maintenance
OU	Operable Units
PAH	polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyls
POU	Possible Operable Units
ppb	part per billion
ppm	part per million
QAPP	Quality Assurance Project Plan
RBC	Risk Based Concentration, EPA Region III, or
RBC	Risk Based Criteria, USACE site document
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RDX	Royal Demolition Explosive (hexahydro-1,3,5-trinitro-1,3,5-triazine)
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SHPO	Virginia State Historic Preservation Officer
SMP	Site Management Plan
SPA	Steamout Pond AOC
sq mi	square mile
SSP	Site Screening Process
SVOC	semivolatile organic compound
TCC	Tidewater Community College
TCE	Trichloroethylene
TCLP	Toxicity Characteristics Leaching Procedure
tetryl	N-methyl-N,2,4,6-tetranitroaniline
TNB	trinitrobenzene
TNT	2,4,6-trinitrotoluene
TPH	total petroleum hydrocarbons
ug	microgram
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tanks
UXO	Unexploded Ordnance
VDOT	Virginia Department of Transportation
VOC	volatile organic compound
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
Weston	Roy F. Weston, Inc.

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12. SITE FIGURE

~ NOTES ~

Background

Construction began on the Pig Point Ordnance Depot in 1917. The facility was originally used as a storage and distribution Depot. The mission was later expanded to include the transfer, salvage and disposal of ordnance and explosives.

The name was changed to the Nansmond Ordnance Depot in 1929. The mission remained about the same through WWII.

In 1950, the facility was transferred to the Department of the Navy and became known as the Marine Corps Supply Forwarding Annex. In 1960, the property was declared excess and was acquired by the Beasley Foundation Boys Academy.

The 975 acre site is currently occupied by Tidewater Community College, Portsmouth Campus, General Electric, Virginia Department of Transportation (I-664), Hampton Roads Sanitation District and Dominion Lands, Inc. (Bridgeway Commerce Park).

Project History

Investigations and clean up work began at FNOD in 1987. In July of 1999, the EPA added the site to the National Priority List (NPL) of private sites.

The kinds of contamination that have been found or are being investigated include: various metals, TNT, TNT degeneration products, ordnance and explosives (OE), petroleum products and industrial solvents.

The human health risks are not fully known yet. All current data indicates that the risks are relatively low and fully manageable.

The work that is currently going on at the site includes: OE removal, various remedial investigations, sampling and the investigation of areas of concern (AOC). Additional soil removals may be required.

Budget: 1987 through 2001 - \$19,000,000
 FY2002 - \$4,330,000
 FY 2003 - \$4,999,000
 FY 2004 - End \$33,435,000

[FNOD Website](http://www.nao.usace.army.mil/projects/nansmond/welcome.html)
www.nao.usace.army.mil/projects/nansmond/welcome.html

LEGEND (Ongoing or planned for FY 03)

NPL LISTED SOURCE AREAS		STATUS
S-1, OU-5	TNT Disposal Area	RI
S-2, OU-1	James River Beachfront Area	RC/RI
S-3, OU-7	Impregnation Kit Area	RC/SC
S-4, OU-3	Horseshoe Pond Area	RI
S-5, OU-2	Steamout Pond & Main Burning Ground	RA/RI
S-6, OU-4	Track K Dump (Tire Pile and Paint Cans)	RC/SC
AREAS OF CONCERN (AOC's)		
A-1, POU-8	Nansmond River Beachfront	RC/SI
A-2, OU-6	Streeter Creek/Lakeview Drive Ground Scars	SI
A-3a, OU-6	Off-Shore Area(Streeter Creek to Pig Point)	SC
A-3b, OU-6	Near-Shore(JRB, NRB, Pier, HSP)	SI
A-4, POU-9	GE Pond/Nansmond Culvert	SI
A-5, OU-6	Tidewater Community College Lake	SI
A-6, POU-10	Marine Corps Power Generation	NS
A-7, OU-6	Area J Lake and Possible Burning Ground Area	NS
A-8, POU-11	Track A Explosive Magazine Line (Disposal Pit)	NS
A-9, POU-11	Track A and B Burning Ground	NS
A-10, POU-9	Track G Explosive Magazine Line (Scars)	SI
A-11, POU-9	Track H and I Explosive Magazine Line (Scars)	SI
A-12, POU-11	Track J Explosive Magazine Line (Scars)	NS
A-13, POU-10	Unknown Abandoned Structure Near WWTP	NS
A-14, POU-9	Track K Explosive Magazine Line - Scars	SI
A-15, POU-9	Track K Explosive Magazine Line - Landfill	SI
A-16, POU-11	Removed Steam Heating Plant	NS
A-17, POU-10	PCB Transformer Removal	NS
A-18, POU-10	Suspected Underground Storage Tanks	NS
A-19, TBD	TCE Contamination Area Adjacent to JRB	SI
A-20, POU-10	Abandoned Water Treatment Plant	NS
A-21, POU-9	Officer's Pool Chlorine Containers	RA
OTHER AREAS OF INVESTIGATION		
O-1	Underground Concrete Structure	Completed
O-2	Renovation Plant Area	Completed
O-3	Athletic Field South	Completed
O-4	Athletic Field North	Completed
O-5	Building E-410	Completed
O-6	Buildings L-11 and L-12	Completed
O-7	Pesticide Drum	SC

SI = Site Investigation
 RC = Removal Complete
 RI = Remedial Investigation
 RA = Removal/Remedial Action
 SC = Site Close Out
 NS = Not Started
 Done = Done

Ordnance and Explosive (OE) Concerns
 POC: Ken Hafner (757-441-7507)

Legend

- Areas**
- Areas of Concern (AOC)
 - Other Areas of Investigation
 - NPL Listed Source Areas
 - FNOD Boundary
 - Parcel Boundaries



Former Nansmond Ordnance Depot (FNOD)



700 0 700 1400 2100 Feet

Scale: 1" = 700'



US Army Corps of Engineers
 Norfolk District

13. SITE SCHEDULES

The Source Areas are presented first in the schedules that follow. The AOCs are presented next. The AOCs are in four general groups (A through D), except for the Nansemond River Beachfront. The groups are based on projected investigation of the areas. Additional work areas follow the AOCs.

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
1	Source Area 1 - TNT Disposal Area	1360 days	Fri 3/1/02	Sat 11/19/05									
2	RI	475 days	Fri 3/1/02	Wed 6/18/03									
3	Draft Workplan	90 days	Fri 3/1/02	Wed 5/29/02									
4	Regulatory Review	90 days	Thu 5/30/02	Tue 8/27/02									
5	Response to comments	30 days	Wed 8/28/02	Thu 9/26/02									
6	Final Document	15 days	Fri 9/27/02	Fri 10/11/02									
7	Draft RI	150 days	Sat 10/12/02	Mon 3/10/03									
8	Army Review	30 days	Tue 3/11/03	Wed 4/9/03									
9	Regulatory Review	30 days	Thu 4/10/03	Fri 5/9/03									
10	Response to comments	25 days	Sat 5/10/03	Tue 6/3/03									
11	Final Document	15 days	Wed 6/4/03	Wed 6/18/03									
12	FS	190 days	Thu 6/19/03	Thu 12/25/03									
13	Draft FS	90 days	Thu 6/19/03	Tue 9/16/03									
14	Army Review	30 days	Wed 9/17/03	Thu 10/16/03									
15	Regulatory Review	30 days	Fri 10/17/03	Sat 11/15/03									
16	Response to comments	25 days	Sun 11/16/03	Wed 12/10/03									
17	Final Document	15 days	Thu 12/11/03	Thu 12/25/03									
18	Proposed Plan	130 days	Fri 12/26/03	Mon 5/3/04									
19	Draft Document	30 days	Fri 12/26/03	Sat 1/24/04									
20	Army Review	30 days	Sun 1/25/04	Mon 2/23/04									
21	Regulatory Review	30 days	Tue 2/24/04	Wed 3/24/04									
22	Response to comments	25 days	Thu 3/25/04	Sun 4/18/04									
23	Final Document	15 days	Mon 4/19/04	Mon 5/3/04									
24	Public Review	60 days	Mon 5/3/04	Fri 7/2/04									
25	Public Meeting	0 days	Mon 5/3/04	Mon 5/3/04									
26	Public comment period	30 days	Tue 5/4/04	Wed 6/2/04									
27	Responsiveness summary	30 days	Thu 6/3/04	Fri 7/2/04									
28	Record of Decision	45 days	Sat 7/3/04	Mon 8/16/04									
29	Draft Document	10 days	Sat 7/3/04	Mon 7/12/04									
30	Army review	15 days	Tue 7/13/04	Tue 7/27/04									
31	Regulatory Review	15 days	Wed 7/28/04	Wed 8/11/04									
32	Signature	5 days	Thu 8/12/04	Mon 8/16/04									
33	RD/RA	325 days	Tue 8/17/04	Thu 7/7/05									
34	Draft Workplan	60 days	Tue 8/17/04	Fri 10/15/04									
35	Army Review	30 days	Sat 10/16/04	Sun 11/14/04									
36	Regulatory Review	30 days	Mon 11/15/04	Tue 12/14/04									
37	Response to comments	25 days	Wed 12/15/04	Sat 1/8/05									
38	conduct Remedial Action	180 days	Sun 1/9/05	Thu 7/7/05									
39	Site Close Out	135 days	Fri 7/8/05	Sat 11/19/05									
40	Evaluation of Confirmation sampling	30 days	Fri 7/8/05	Sat 8/6/05									
41	Draft Close Out Report	30 days	Sun 8/7/05	Mon 9/5/05									
42	Army Review	30 days	Tue 9/6/05	Wed 10/5/05									
43	Regulatory Review	30 days	Thu 10/6/05	Fri 11/4/05									
44	Final documentation	15 days	Sat 11/5/05	Sat 11/19/05									
45	LTO/LTM	1725 days	Sun 1/9/05	Tue 9/29/09									
46	Operation period	1725 days	Sun 1/9/05	Tue 9/29/09									
47	5 year reviews	1725 days	Sun 1/9/05	Tue 9/29/09									
48													
49	Source Area 2 - James River Beachfront	1257 days	Mon 12/3/01	Thu 5/12/05									
50	Complete Removal Action documentation	345 days	Mon 12/3/01	Tue 11/12/02									
51	Evaluation of Confirmation Sampling	30 days	Mon 12/3/01	Tue 1/1/02									
52	Draft Close Out Report	240 days	Wed 1/2/02	Thu 8/29/02									
53	Army Review	30 days	Fri 8/30/02	Sat 9/28/02									
54	Regulatory Review	30 days	Sun 9/29/02	Mon 10/28/02									
55	Final Documentation	15 days	Tue 10/29/02	Tue 11/12/02									
56	Return to RI/FS Decision	1 day	Wed 11/13/02	Wed 11/13/02									
57	PDT Review and Decision	1 day	Wed 11/13/02	Wed 11/13/02									
58	RI/FS	250 days	Wed 10/1/03	Sun 6/6/04									
59	Draft RI/FS (Risk Assessment)	150 days	Wed 10/1/03	Fri 2/27/04									
60	Army Review	30 days	Sat 2/28/04	Sun 3/28/04									
61	Regulatory Review	30 days	Mon 3/29/04	Tue 4/27/04									
62	Response to comments	25 days	Wed 4/28/04	Sat 5/22/04									
63	Final Document	15 days	Sun 5/23/04	Sun 6/6/04									
64	Proposed Plan	130 days	Mon 6/7/04	Thu 10/14/04									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
65	Draft Document	30 days	Mon 6/7/04	Tue 7/6/04									
66	Army Review	30 days	Wed 7/7/04	Thu 8/5/04									
67	Regulatory Review	30 days	Fri 8/6/04	Sat 9/4/04									
68	Response to comments	25 days	Sun 9/5/04	Wed 9/29/04									
69	Final Document	15 days	Thu 9/30/04	Thu 10/14/04									
70	Public Review	60 days	Thu 10/14/04	Mon 12/13/04									
71	Public Meeting	0 days	Thu 10/14/04	Thu 10/14/04									
72	Public comment period	30 days	Fri 10/15/04	Sat 11/13/04									
73	Responsiveness summary	30 days	Sun 11/14/04	Mon 12/13/04									
74	Record of Decision	45 days	Tue 12/14/04	Thu 1/27/05									
75	Draft Document	10 days	Tue 12/14/04	Thu 12/23/04									
76	Army review	15 days	Fri 12/24/04	Fri 1/7/05									
77	Regulatory Review	15 days	Sat 1/8/05	Sat 1/22/05									
78	Signature	5 days	Sun 1/23/05	Thu 1/27/05									
79	Site Close Out	105 days	Fri 1/28/05	Thu 5/12/05									
80	Confirmation sampling	30 days	Fri 1/28/05	Sat 2/26/05									
81	Army Review	30 days	Sun 2/27/05	Mon 3/28/05									
82	Regulatory Review	30 days	Tue 3/29/05	Wed 4/27/05									
83	Final documentation	15 days	Thu 4/28/05	Thu 5/12/05									
84													
85	Source Area 3 - Impregnite Kit Area	436 days	Wed 2/6/02	Thu 4/17/03									
86	Proposed Plan	345 days	Wed 2/6/02	Thu 1/16/03									
87	Document Review	22 days	Wed 2/6/02	Wed 2/27/02									
88	Strategy Meeting	0 days	Thu 4/4/02	Thu 4/4/02									
89	Internal Draft Proposed Plan	90 days	Thu 4/4/02	Tue 7/2/02									
90	USACE Review	94 days	Wed 7/3/02	Fri 10/4/02									
91	Draft Proposed Plan	15 days	Sat 10/5/02	Sat 10/19/02									
92	Regulatory Review	30 edays	Sat 10/19/02	Mon 11/18/02									
93	Final Proposed Plan	15 days	Tue 11/19/02	Tue 12/3/02									
94	Public Review/Comment Period	30 edays	Tue 12/3/02	Thu 1/2/03									
95	Public Meeting	0 days	Tue 12/3/02	Tue 12/3/02									
96	Finalize Comments	14 days	Fri 1/3/03	Thu 1/16/03									
97	Record of Decision	105 days	Thu 1/2/03	Thu 4/17/03									
98	Internal Draft ROD	14 days	Fri 1/17/03	Thu 1/30/03									
99	USACE Review	30 edays	Thu 1/30/03	Sat 3/1/03									
100	Draft ROD/RR	17 days	Sun 3/2/03	Tue 3/18/03									
101	Regulatory Review	30 edays	Tue 3/18/03	Thu 4/17/03									
102	Responsiveness Summary	30 edays	Thu 1/2/03	Sat 2/1/03									
103	Final ROD/RR	12 days	Sun 2/2/03	Thu 2/13/03									
104	Notice of Availability	0 days	Thu 2/13/03	Thu 2/13/03									
105													
106	Source Area 4 - Horseshoe Pond Area	1397 days	Mon 7/1/02	Thu 4/27/06									
107	SRI (Phase II)	595 days	Mon 7/1/02	Sun 2/15/04									
108	Draft Workplan	60 days	Mon 7/1/02	Thu 8/29/02									
109	Regulatory Review	30 days	Fri 8/30/02	Sat 9/28/02									
110	Response to comments	25 days	Sun 9/29/02	Wed 10/23/02									
111	Final Document	15 days	Thu 10/24/02	Thu 11/7/02									
112	Draft SRI	365 days	Fri 11/8/02	Fri 11/7/03									
113	Army Review	30 days	Sat 11/8/03	Sun 12/7/03									
114	Regulatory Review	30 days	Mon 12/8/03	Tue 1/6/04									
115	Response to comments	25 days	Wed 1/7/04	Sat 1/31/04									
116	Final Document	15 days	Sun 2/1/04	Sun 2/15/04									
117	FS	190 days	Mon 2/16/04	Mon 8/23/04									
118	Draft FS	90 days	Mon 2/16/04	Sat 5/15/04									
119	Army Review	30 days	Sun 5/16/04	Mon 6/14/04									
120	Regulatory Review	30 days	Tue 6/15/04	Wed 7/14/04									
121	Response to comments	25 days	Thu 7/15/04	Sun 8/8/04									
122	Final Document	15 days	Mon 8/9/04	Mon 8/23/04									
123	Proposed Plan	130 days	Thu 9/30/04	Sun 2/6/05									
124	Draft Document	30 days	Thu 9/30/04	Fri 10/29/04									
125	Army Review	30 days	Sat 10/30/04	Sun 11/28/04									
126	Regulatory Review	30 days	Mon 11/29/04	Tue 12/28/04									
127	Response to comments	25 days	Wed 12/29/04	Sat 1/22/05									
128	Final Document	15 days	Sun 1/23/05	Sun 2/6/05									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
129	Public Review	60 days	Sun 2/6/05	Thu 4/7/05									
130	Public Meeting	0 days	Sun 2/6/05	Sun 2/6/05									◆ 2/6
131	Public comment period	30 days	Mon 2/7/05	Tue 3/8/05									
132	Responsiveness summary	30 days	Wed 3/9/05	Thu 4/7/05									
133	Record of Decision	45 days	Fri 4/8/05	Sun 5/22/05									
134	Draft Document	10 days	Fri 4/8/05	Sun 4/17/05									
135	Army review	15 days	Mon 4/18/05	Mon 5/2/05									
136	Regulatory Review	15 days	Tue 5/3/05	Tue 5/17/05									
137	Signature	5 days	Wed 5/18/05	Sun 5/22/05									
138	RD/RA	205 days	Mon 5/23/05	Tue 12/13/05									
139	Draft Workplan	60 days	Mon 5/23/05	Thu 7/21/05									
140	Army Review	30 days	Fri 7/22/05	Sat 8/20/05									
141	Regulatory Review	30 days	Sun 8/21/05	Mon 9/19/05									
142	Response to comments	25 days	Tue 9/20/05	Fri 10/14/05									
143	conduct Remedial Action	60 days	Sat 10/15/05	Tue 12/13/05									
144	Site Close Out	135 days	Wed 12/14/05	Thu 4/27/06									
145	Evaluation of Confirmation sampling	30 days	Wed 12/14/05	Thu 1/12/06									
146	Draft FCOR	30 days	Fri 1/13/06	Sat 2/11/06									
147	Army Review	30 days	Sun 2/12/06	Mon 3/13/06									
148	Regulatory Review	30 days	Tue 3/14/06	Wed 4/12/06									
149	Final documentation	15 days	Thu 4/13/06	Thu 4/27/06									
150													
151	Source Area 5- Steamout Pond & Main Burning Ground	2260 days	Mon 7/1/02	Sat 9/6/08									
152	SRI (Phase II)	595 days	Mon 7/1/02	Sun 2/15/04									
153	Draft Workplan	60 days	Mon 7/1/02	Thu 8/29/02									
154	Regulatory Review	30 days	Fri 8/30/02	Sat 9/28/02									
155	Response to comments	25 days	Sun 9/29/02	Wed 10/23/02									
156	Final Document	15 days	Thu 10/24/02	Thu 11/7/02									
157	Draft RI	365 days	Fri 11/8/02	Fri 11/7/03									
158	Army Review	30 days	Sat 11/8/03	Sun 12/7/03									
159	Regulatory Review	30 days	Mon 12/8/03	Tue 1/6/04									
160	Response to comments	25 days	Wed 1/7/04	Sat 1/31/04									
161	Final Document	15 days	Sun 2/1/04	Sun 2/15/04									
162	FS	190 days	Mon 2/16/04	Mon 8/23/04									
163	Draft FS	90 days	Mon 2/16/04	Sat 5/15/04									
164	Army Review	30 days	Sun 5/16/04	Mon 6/14/04									
165	Regulatory Review	30 days	Tue 6/15/04	Wed 7/14/04									
166	Response to comments	25 days	Thu 7/15/04	Sun 8/8/04									
167	Final Document	15 days	Mon 8/9/04	Mon 8/23/04									
168	Proposed Plan	130 days	Sat 2/10/07	Tue 6/19/07									
169	Draft Document	30 days	Sat 2/10/07	Sun 3/11/07									
170	Army Review	30 days	Mon 3/12/07	Tue 4/10/07									
171	Regulatory Review	30 days	Wed 4/11/07	Thu 5/10/07									
172	Response to comments	25 days	Fri 5/11/07	Mon 6/4/07									
173	Final Document	15 days	Tue 6/5/07	Tue 6/19/07									
174	Public Review	60 days	Tue 6/19/07	Sat 8/18/07									
175	Public Meeting	0 days	Tue 6/19/07	Tue 6/19/07									
176	Public comment period	30 days	Wed 6/20/07	Thu 7/19/07									
177	Responsiveness summary	30 days	Fri 7/20/07	Sat 8/18/07									
178	Record of Decision	45 days	Sun 8/19/07	Tue 10/2/07									
179	Draft Document	10 days	Sun 8/19/07	Tue 8/28/07									
180	Army review	15 days	Wed 8/29/07	Wed 9/12/07									
181	Regulatory Review	15 days	Thu 9/13/07	Thu 9/27/07									
182	Signature	5 days	Fri 9/28/07	Tue 10/2/07									
183	RD/RA	205 days	Wed 10/3/07	Thu 4/24/08									
184	Draft Workplan	60 days	Wed 10/3/07	Sat 12/1/07									
185	Army Review	30 days	Sun 12/2/07	Mon 12/31/07									
186	Regulatory Review	30 days	Tue 1/1/08	Wed 1/30/08									
187	Response to comments	25 days	Thu 1/31/08	Sun 2/24/08									
188	conduct Remedial Action	60 days	Mon 2/25/08	Thu 4/24/08									
189	Site Close Out	135 days	Fri 4/25/08	Sat 9/6/08									
190	Evaluation of Confirmation sampling	30 days	Fri 4/25/08	Sat 5/24/08									
191	Draft FCOR	30 days	Sun 5/25/08	Mon 6/23/08									
192	Army Review	30 days	Tue 6/24/08	Wed 7/23/08									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
193	Regulatory Review	30 days	Thu 7/24/08	Fri 8/22/08									
194	Final documentation	15 days	Sat 8/23/08	Sat 9/6/08									
195													
196	Source Area 6 - Track K Dump (Tire Pile and Paint Cans)	654 days	Tue 2/12/02	Thu 11/27/03									
197	Confirmation Sampling at Tire Pile/Paint Can Area	64 days	Tue 2/12/02	Tue 4/16/02									
198	Mobilization	15 days	Tue 2/12/02	Tue 2/26/02									
199	Soil Sampling	1 day	Wed 2/27/02	Wed 2/27/02									
200	Wait for analytical	28 days	Thu 2/28/02	Wed 3/27/02									
201	Data validation	20 days	Thu 3/28/02	Tue 4/16/02									
202	Site Screening Process	138 days	Fri 10/11/02	Tue 2/25/03									
203	Internal Draft SSP Report	35 days	Fri 10/11/02	Thu 11/14/02									
204	USACE Review	30 edays	Thu 11/14/02	Sat 12/14/02									
205	Draft Site Screen Process Report	15 days	Sun 12/15/02	Sun 12/29/02									
206	Wait for comments by regulators	30 edays	Sun 12/29/02	Tue 1/28/03									
207	Response to comments	14 days	Wed 1/29/03	Tue 2/11/03									
208	Final Site Screening Process	14 days	Wed 2/12/03	Tue 2/25/03									
209	Proposed Plan	138 days	Wed 2/26/03	Sun 7/13/03									
210	Internal Draft Proposed Plan	12 days	Wed 2/26/03	Sun 3/9/03									
211	USACE Review	30 edays	Sun 3/9/03	Tue 4/8/03									
212	Draft Proposed Plan	12 days	Wed 4/9/03	Sun 4/20/03									
213	Regulatory Review	30 edays	Sun 4/20/03	Tue 5/20/03									
214	Final Proposed Plan	12 days	Wed 5/21/03	Sun 6/1/03									
215	Public Review/Comment Period	30 edays	Sun 6/1/03	Tue 7/1/03									
216	Public Meeting	0 days	Tue 6/3/03	Tue 6/3/03									
217	Finalize Comments	12 days	Wed 7/2/03	Sun 7/13/03									
218	Record of Decision	170 days	Wed 2/26/03	Thu 8/14/03									
219	Internal Draft ROD	12 days	Wed 2/26/03	Sun 3/9/03									
220	USACE Review	30 edays	Sun 3/9/03	Tue 4/8/03									
221	Draft ROD/RR	12 days	Wed 4/9/03	Sun 4/20/03									
222	Regulatory Review	30 edays	Sun 4/20/03	Tue 5/20/03									
223	Responsiveness Summary	30 edays	Tue 7/1/03	Thu 7/31/03									
224	Final ROD/RR	14 days	Fri 8/1/03	Thu 8/14/03									
225	Notice of Availability	0 days	Thu 8/14/03	Thu 8/14/03									
226	Site Close Out	105 days	Fri 8/15/03	Thu 11/27/03									
227	Draft FCOR	30 days	Fri 8/15/03	Sat 9/13/03									
228	Army Review	30 days	Sun 9/14/03	Mon 10/13/03									
229	Regulatory Review	30 days	Tue 10/14/03	Wed 11/12/03									
230	Final documentation	15 days	Thu 11/13/03	Thu 11/27/03									
231													
232													
233	AOC 1 - Nansemond River Beachfront	978 days	Wed 1/1/03	Sun 9/4/05									
234	Complete Removal Action documentation	195 days	Wed 1/1/03	Mon 7/14/03									
235	Confirmation Sampling	30 days	Wed 1/1/03	Thu 1/30/03									
236	SSP Evaluation	60 days	Fri 1/31/03	Mon 3/31/03									
237	Draft Close Out Report	30 days	Tue 4/1/03	Wed 4/30/03									
238	Army Review	30 days	Thu 5/1/03	Fri 5/30/03									
239	Regulatory Review	30 days	Sat 5/31/03	Sun 6/29/03									
240	Final Documentation	15 days	Mon 6/30/03	Mon 7/14/03									
241	Return to RI/FS Decision	1 day	Tue 7/15/03	Tue 7/15/03									
242	PDT Review and Decision	1 day	Tue 7/15/03	Tue 7/15/03									
243	RI/FS	250 days	Wed 7/16/03	Sun 3/21/04									
244	Draft RI/FS (Risk Assessment)	150 days	Wed 7/16/03	Fri 12/12/03									
245	Army Review	30 days	Sat 12/13/03	Sun 1/11/04									
246	Regulatory Review	30 days	Mon 1/12/04	Tue 2/10/04									
247	Response to comments	25 days	Wed 2/11/04	Sat 3/6/04									
248	Final Document	15 days	Sun 3/7/04	Sun 3/21/04									
249	Proposed Plan	130 days	Thu 9/30/04	Sun 2/6/05									
250	Draft Document	30 days	Thu 9/30/04	Fri 10/29/04									
251	Army Review	30 days	Sat 10/30/04	Sun 11/28/04									
252	Regulatory Review	30 days	Mon 11/29/04	Tue 12/28/04									
253	Response to comments	25 days	Wed 12/29/04	Sat 1/22/05									
254	Final Document	15 days	Sun 1/23/05	Sun 2/6/05									
255	Public Review	60 days	Sun 2/6/05	Thu 4/7/05									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
257	Public comment period	30 days	Mon 2/7/05	Tue 3/8/05									
258	Responsiveness summary	30 days	Wed 3/9/05	Thu 4/7/05									
259	Record of Decision	45 days	Fri 4/8/05	Sun 5/22/05									
260	Draft Document	10 days	Fri 4/8/05	Sun 4/17/05									
261	Army review	15 days	Mon 4/18/05	Mon 5/2/05									
262	Regulatory Review	15 days	Tue 5/3/05	Tue 5/17/05									
263	Signature	5 days	Wed 5/18/05	Sun 5/22/05									
264	Site Close Out	105 days	Mon 5/23/05	Sun 9/4/05									
265	Draft FCOR	30 days	Mon 5/23/05	Tue 6/21/05									
266	Army Review	30 days	Wed 6/22/05	Thu 7/21/05									
267	Regulatory Review	30 days	Fri 7/22/05	Sat 8/20/05									
268	Final documentation	15 days	Sun 8/21/05	Sun 9/4/05									
269													
270	AOC 19 (GP A) - TCE Contamination Adjacent to the JRB	465 days	Fri 11/1/02	Sun 2/8/04									
271	PA/SI Site Screening Process	345 days	Fri 11/1/02	Sat 10/11/03									
272	Sampling	90 days	Fri 11/1/02	Wed 1/29/03									
273	Second round of sampling	90 days	Thu 1/30/03	Tue 4/29/03									
274	Third round of sampling	90 days	Wed 4/30/03	Mon 7/28/03									
275	Fourth round of sampling	45 days	Tue 7/29/03	Thu 9/11/03									
276	PDT data review and decision	30 days	Fri 9/12/03	Sat 10/11/03									
277	Site Close Out	120 days	Sun 10/12/03	Sun 2/8/04									
278	Draft FCOR	30 days	Sun 10/12/03	Mon 11/10/03									
279	Army Review	30 days	Tue 11/11/03	Wed 12/10/03									
280	Regulatory Review	30 days	Thu 12/11/03	Fri 1/9/04									
281	Final documentation	30 days	Sat 1/10/04	Sun 2/8/04									
282													
283	AOC 2 (GP A) - Streeter Creek/Lakeview Drive Ground Scars	205 days	Wed 1/1/03	Thu 7/24/03									
284	PA/SI Site Screening Process	205 days	Wed 1/1/03	Thu 7/24/03									
285	Draft Workplan	30 days	Wed 1/1/03	Thu 1/30/03									
286	Army Review	30 days	Fri 1/31/03	Sat 3/1/03									
287	Regulatory review	30 days	Sun 3/2/03	Mon 3/31/03									
288	Response to comments	25 days	Tue 4/1/03	Fri 4/25/03									
289	Final Workplan	15 days	Sat 4/26/03	Sat 5/10/03									
290	Sampling	45 days	Sun 5/11/03	Tue 6/24/03									
291	PDT data review and decision	30 days	Wed 6/25/03	Thu 7/24/03									
292													
293	AOC 3a (GP A) - Off-Shore Area	470 days	Tue 10/1/02	Tue 1/13/04									
294	Task 15. BERA Report	110 days	Tue 10/1/02	Sat 1/18/03									
295	ACE Draft	19 days	Tue 10/1/02	Sat 10/19/02									
296	Receive ACE comments (est.)	30 edays	Sat 11/2/02	Mon 12/2/02									
297	Draft Final (DF)	7 days	Tue 12/3/02	Mon 12/9/02									
298	Receive BTAG comments (est.)	28 days	Tue 12/10/02	Mon 1/6/03									
299	Final	12 days	Tue 1/7/03	Sat 1/18/03									
300	HHRA	130 days	Tue 10/1/02	Fri 2/7/03									
301	Draft Document	30 days	Tue 10/1/02	Wed 10/30/02									
302	Army Review	30 days	Thu 10/31/02	Fri 11/29/02									
303	Regulatory Review	30 days	Sat 11/30/02	Sun 12/29/02									
304	Response to comments	25 days	Mon 12/30/02	Thu 1/23/03									
305	Final Document	15 days	Fri 1/24/03	Fri 2/7/03									
306	Proposed Plan	130 days	Sat 2/8/03	Tue 6/17/03									
307	Draft Document	30 days	Sat 2/8/03	Sun 3/9/03									
308	Army Review	30 days	Mon 3/10/03	Tue 4/8/03									
309	Regulatory Review	30 days	Wed 4/9/03	Thu 5/8/03									
310	Response to comments	25 days	Fri 5/9/03	Mon 6/2/03									
311	Final Document	15 days	Tue 6/3/03	Tue 6/17/03									
312	Public Review	60 days	Tue 6/17/03	Sat 8/16/03									
313	Public Meeting	0 days	Tue 6/17/03	Tue 6/17/03									
314	Public comment period	30 days	Wed 6/18/03	Thu 7/17/03									
315	Responsiveness summary	30 days	Fri 7/18/03	Sat 8/16/03									
316	Record of Decision	45 days	Sun 8/17/03	Tue 9/30/03									
317	Draft Document	10 days	Sun 8/17/03	Tue 8/26/03									
318	Army review	15 days	Wed 8/27/03	Wed 9/10/03									
319	Regulatory Review	15 days	Thu 9/11/03	Thu 9/25/03									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
321	Site Close Out	105 days	Wed 10/1/03	Tue 1/13/04									
322	Draft FCOR	30 days	Wed 10/1/03	Thu 10/30/03									
323	Army Review	30 days	Fri 10/31/03	Sat 11/29/03									
324	Regulatory Review	30 days	Sun 11/30/03	Mon 12/29/03									
325	Final documentation	15 days	Tue 12/30/03	Tue 1/13/04									
326													
327	AOC 3b (GP A) - Near Shore Area JRB	365 days	Tue 10/1/02	Tue 9/30/03									
328	Baseline Ecological Risk Assessment	365 days	Tue 10/1/02	Tue 9/30/03									
329	Draft Workplan	60 days	Tue 10/1/02	Fri 11/29/02									
330	Regulatory Review	30 days	Sat 11/30/02	Sun 12/29/02									
331	Response to comments	25 days	Mon 12/30/02	Thu 1/23/03									
332	Final Document	15 days	Fri 1/24/03	Fri 2/7/03									
333	Draft Ecological Risk Assessment	135 days	Sat 2/8/03	Sun 6/22/03									
334	Army Review	30 days	Mon 6/23/03	Tue 7/22/03									
335	Regulatory Review	30 days	Wed 7/23/03	Thu 8/21/03									
336	Response to comments	25 days	Fri 8/22/03	Mon 9/15/03									
337	Final Document	15 days	Tue 9/16/03	Tue 9/30/03									
338	HHRA	130 days	Sat 2/8/03	Tue 6/17/03									
339	Draft Document	30 days	Sat 2/8/03	Sun 3/9/03									
340	Army Review	30 days	Mon 3/10/03	Tue 4/8/03									
341	Regulatory Review	30 days	Wed 4/9/03	Thu 5/8/03									
342	Response to comments	25 days	Fri 5/9/03	Mon 6/2/03									
343	Final Document	15 days	Tue 6/3/03	Tue 6/17/03									
344													
345	AOC 3b (GP A) - Near Shore Area Pier	690 days	Tue 10/1/02	Fri 8/20/04									
346	Baseline Ecological Risk Assessment	365 days	Tue 10/1/02	Tue 9/30/03									
347	Draft Workplan	60 days	Tue 10/1/02	Fri 11/29/02									
348	Regulatory Review	30 days	Sat 11/30/02	Sun 12/29/02									
349	Response to comments	25 days	Mon 12/30/02	Thu 1/23/03									
350	Final Document	15 days	Fri 1/24/03	Fri 2/7/03									
351	Draft Ecological Risk Assessment	135 days	Sat 2/8/03	Sun 6/22/03									
352	Army Review	30 days	Mon 6/23/03	Tue 7/22/03									
353	Regulatory Review	30 days	Wed 7/23/03	Thu 8/21/03									
354	Response to comments	25 days	Fri 8/22/03	Mon 9/15/03									
355	Final Document	15 days	Tue 9/16/03	Tue 9/30/03									
356	HHRA	130 days	Sat 2/8/03	Tue 6/17/03									
357	Draft Document	30 days	Sat 2/8/03	Sun 3/9/03									
358	Army Review	30 days	Mon 3/10/03	Tue 4/8/03									
359	Regulatory Review	30 days	Wed 4/9/03	Thu 5/8/03									
360	Response to comments	25 days	Fri 5/9/03	Mon 6/2/03									
361	Final Document	15 days	Tue 6/3/03	Tue 6/17/03									
362	Proposed Plan	130 days	Tue 9/16/03	Fri 1/23/04									
363	Draft Document	30 days	Tue 9/16/03	Wed 10/15/03									
364	Army Review	30 days	Thu 10/16/03	Fri 11/14/03									
365	Regulatory Review	30 days	Sat 11/15/03	Sun 12/14/03									
366	Response to comments	25 days	Mon 12/15/03	Thu 1/8/04									
367	Final Document	15 days	Fri 1/9/04	Fri 1/23/04									
368	Public Review	60 days	Fri 1/23/04	Tue 3/23/04									
369	Public Meeting	0 days	Fri 1/23/04	Fri 1/23/04									
370	Public comment period	30 days	Sat 1/24/04	Sun 2/22/04									
371	Responsiveness summary	30 days	Mon 2/23/04	Tue 3/23/04									
372	Record of Decision	45 days	Wed 3/24/04	Fri 5/7/04									
373	Draft Document	10 days	Wed 3/24/04	Fri 4/2/04									
374	Army review	15 days	Sat 4/3/04	Sat 4/17/04									
375	Regulatory Review	15 days	Sun 4/18/04	Sun 5/2/04									
376	Signature	5 days	Mon 5/3/04	Fri 5/7/04									
377	Site Close Out	105 days	Sat 5/8/04	Fri 8/20/04									
378	Draft FCOR	30 days	Sat 5/8/04	Sun 6/6/04									
379	Army Review	30 days	Mon 6/7/04	Tue 7/6/04									
380	Regulatory Review	30 days	Wed 7/7/04	Thu 8/5/04									
381	Final documentation	15 days	Fri 8/6/04	Fri 8/20/04									
382													
383	AOC 3b (GP A) - Near Shore Area NRB	365 days	Wed 10/1/03	Wed 9/29/04									
384	Baseline Ecological Risk Assessment	365 days	Wed 10/1/03	Wed 9/29/04									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
385	Draft Workplan	60 days	Wed 10/1/03	Sat 11/29/03									
386	Regulatory Review	30 days	Sun 11/30/03	Mon 12/29/03									
387	Response to comments	25 days	Tue 12/30/03	Fri 1/23/04									
388	Final Document	15 days	Sat 1/24/04	Sat 2/7/04									
389	Draft Ecological Risk Assessment	135 days	Sun 2/8/04	Mon 6/21/04									
390	Army Review	30 days	Tue 6/22/04	Wed 7/21/04									
391	Regulatory Review	30 days	Thu 7/22/04	Fri 8/20/04									
392	Response to comments	25 days	Sat 8/21/04	Tue 9/14/04									
393	Final Document	15 days	Wed 9/15/04	Wed 9/29/04									
394	HHRA	130 days	Sun 2/8/04	Wed 6/16/04									
395	Draft Document	30 days	Sun 2/8/04	Mon 3/8/04									
396	Army Review	30 days	Tue 3/9/04	Wed 4/7/04									
397	Regulatory Review	30 days	Thu 4/8/04	Fri 5/7/04									
398	Response to comments	25 days	Sat 5/8/04	Tue 6/1/04									
399	Final Document	15 days	Wed 6/2/04	Wed 6/16/04									
400													
401	AOC 3b (GP A) - Near Shore Area HSP	365 days	Wed 10/1/03	Wed 9/29/04									
402	Baseline Ecological Risk Assessment	365 days	Wed 10/1/03	Wed 9/29/04									
403	Draft Workplan	60 days	Wed 10/1/03	Sat 11/29/03									
404	Regulatory Review	30 days	Sun 11/30/03	Mon 12/29/03									
405	Response to comments	25 days	Tue 12/30/03	Fri 1/23/04									
406	Final Document	15 days	Sat 1/24/04	Sat 2/7/04									
407	Draft Ecological Risk Assessment	135 days	Sun 2/8/04	Mon 6/21/04									
408	Army Review	30 days	Tue 6/22/04	Wed 7/21/04									
409	Regulatory Review	30 days	Thu 7/22/04	Fri 8/20/04									
410	Response to comments	25 days	Sat 8/21/04	Tue 9/14/04									
411	Final Document	15 days	Wed 9/15/04	Wed 9/29/04									
412	HHRA	130 days	Sun 2/8/04	Wed 6/16/04									
413	Draft Document	30 days	Sun 2/8/04	Mon 3/8/04									
414	Army Review	30 days	Tue 3/9/04	Wed 4/7/04									
415	Regulatory Review	30 days	Thu 4/8/04	Fri 5/7/04									
416	Response to comments	25 days	Sat 5/8/04	Tue 6/1/04									
417	Final Document	15 days	Wed 6/2/04	Wed 6/16/04									
418													
419	AOC 7 (GP A) - Area J Lake and Possible Burning Ground Area	511 days	Mon 12/3/01	Sun 4/27/03									
420	PA/SI Site Screening Process	511 days	Mon 12/3/01	Sun 4/27/03									
421	Desk top audit	60 days	Mon 12/3/01	Thu 1/31/02									
422	Data Collection as part of Site Wide Hydroli	365 days	Fri 3/29/02	Fri 3/28/03									
423	SSP Close Out Report	30 days	Sat 3/29/03	Sun 4/27/03									
424													
425	AOC 5 (GP A) - Tidewater Community College Lake	511 days	Mon 12/3/01	Sun 4/27/03									
426	PA/SI Site Screening Process	511 days	Mon 12/3/01	Sun 4/27/03									
427	Desk top audit	60 days	Mon 12/3/01	Thu 1/31/02									
428	Data Collection as part of Site Wide Hydroli	365 days	Fri 3/29/02	Fri 3/28/03									
429	SSP Close Out Report	30 days	Sat 3/29/03	Sun 4/27/03									
430													
431	AOC 21 (GP B) - Officer's Pool Chlorine Containers	91 days	Tue 10/1/02	Mon 12/30/02									
432	TCC Remove Pool Chemical Containers	90 days	Tue 10/1/02	Sun 12/29/02									
433	PDT Decision to remove AOC from List	1 day	Mon 12/30/02	Mon 12/30/02									
434													
435	AOC 4 (GP B) - GE Pond/Nansemond Culvert (includes swale)	205 days	Tue 10/1/02	Wed 4/23/03									
436	PA/SI Site Screening Process	205 days	Tue 10/1/02	Wed 4/23/03									
437	Draft Workplan	30 days	Tue 10/1/02	Wed 10/30/02									
438	Army Review	30 days	Thu 10/31/02	Fri 11/29/02									
439	Regulatory review	30 days	Sat 11/30/02	Sun 12/29/02									
440	Response to comments	25 days	Mon 12/30/02	Thu 1/23/03									
441	Final Workplan	15 days	Fri 1/24/03	Fri 2/7/03									
442	Sampling	45 days	Sat 2/8/03	Mon 3/24/03									
443	SSP Close Out Report	30 days	Tue 3/25/03	Wed 4/23/03									
444													
445	AOC 10 (GP B) - Track G Explosive Magazine Line (Scars)	265 days	Wed 1/1/03	Mon 9/22/03									
446	PA/SI Site Screening Process	265 days	Wed 1/1/03	Mon 9/22/03									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
447	Desk top audit	60 days	Wed 1/1/03	Sat 3/1/03									
448	Draft Workplan	30 days	Sun 3/2/03	Mon 3/31/03									
449	Army Review	30 days	Tue 4/1/03	Wed 4/30/03									
450	Regulatory review	30 days	Thu 5/1/03	Fri 5/30/03									
451	Response to comments	25 days	Sat 5/31/03	Tue 6/24/03									
452	Final Workplan	15 days	Wed 6/25/03	Wed 7/9/03									
453	Sampling	45 days	Thu 7/10/03	Sat 8/23/03									
454	SSP Close Out Report	30 days	Sun 8/24/03	Mon 9/22/03									
455													
456	AOC 11 (GP B) - Track H and I Explosive Magazine Line (Scars)	265 days	Wed 1/1/03	Mon 9/22/03									
457	PA/SI Site Screening Process	265 days	Wed 1/1/03	Mon 9/22/03									
458	Desk top audit	60 days	Wed 1/1/03	Sat 3/1/03									
459	Draft Workplan	30 days	Sun 3/2/03	Mon 3/31/03									
460	Army Review	30 days	Tue 4/1/03	Wed 4/30/03									
461	Regulatory review	30 days	Thu 5/1/03	Fri 5/30/03									
462	Response to comments	25 days	Sat 5/31/03	Tue 6/24/03									
463	Final Workplan	15 days	Wed 6/25/03	Wed 7/9/03									
464	Sampling	45 days	Thu 7/10/03	Sat 8/23/03									
465	SSP Close Out Report	30 days	Sun 8/24/03	Mon 9/22/03									
466													
467	AOC 14 (GP B) - Track K Explosive Magazine Line (Scars)	265 days	Wed 1/1/03	Mon 9/22/03									
468	PA/SI Site Screening Process	265 days	Wed 1/1/03	Mon 9/22/03									
469	Desk top audit	60 days	Wed 1/1/03	Sat 3/1/03									
470	Draft Workplan	30 days	Sun 3/2/03	Mon 3/31/03									
471	Army Review	30 days	Tue 4/1/03	Wed 4/30/03									
472	Regulatory review	30 days	Thu 5/1/03	Fri 5/30/03									
473	Response to comments	25 days	Sat 5/31/03	Tue 6/24/03									
474	Final Workplan	15 days	Wed 6/25/03	Wed 7/9/03									
475	Sampling	45 days	Thu 7/10/03	Sat 8/23/03									
476	SSP Close Out Report	30 days	Sun 8/24/03	Mon 9/22/03									
477													
478	AOC 15 (GP B) - Track K Explosive Magazine Line Landfill	265 days	Wed 1/1/03	Mon 9/22/03									
479	PA/SI Site Screening Process	265 days	Wed 1/1/03	Mon 9/22/03									
480	Desk top audit	60 days	Wed 1/1/03	Sat 3/1/03									
481	Draft Workplan	30 days	Sun 3/2/03	Mon 3/31/03									
482	Army Review	30 days	Tue 4/1/03	Wed 4/30/03									
483	Regulatory review	30 days	Thu 5/1/03	Fri 5/30/03									
484	Response to comments	25 days	Sat 5/31/03	Tue 6/24/03									
485	Final Workplan	15 days	Wed 6/25/03	Wed 7/9/03									
486	Sampling	45 days	Thu 7/10/03	Sat 8/23/03									
487	SSP Close Out Report	30 days	Sun 8/24/03	Mon 9/22/03									
488													
489	AOC 13 (GP C) - Unknown Abandoned Structures near WWTP	265 days	Thu 1/1/04	Tue 9/21/04									
490	PA/SI Site Screening Process	265 days	Thu 1/1/04	Tue 9/21/04									
491	Desk top audit	60 days	Thu 1/1/04	Sun 2/29/04									
492	Draft Workplan	30 days	Mon 3/1/04	Tue 3/30/04									
493	Army Review	30 days	Wed 3/31/04	Thu 4/29/04									
494	Regulatory review	30 days	Fri 4/30/04	Sat 5/29/04									
495	Response to comments	25 days	Sun 5/30/04	Wed 6/23/04									
496	Final Workplan	15 days	Thu 6/24/04	Thu 7/8/04									
497	Sampling	45 days	Fri 7/9/04	Sun 8/22/04									
498	SSP Close Out Report	30 days	Mon 8/23/04	Tue 9/21/04									
499													
500	AOC 17 (GP C) - PCB Transformer Removal	265 days	Thu 1/1/04	Tue 9/21/04									
501	PA/SI Site Screening Process	265 days	Thu 1/1/04	Tue 9/21/04									
502	Desk top audit	60 days	Thu 1/1/04	Sun 2/29/04									
503	Draft Workplan	30 days	Mon 3/1/04	Tue 3/30/04									
504	Army Review	30 days	Wed 3/31/04	Thu 4/29/04									
505	Regulatory review	30 days	Fri 4/30/04	Sat 5/29/04									
506	Response to comments	25 days	Sun 5/30/04	Wed 6/23/04									
507	Final Workplan	15 days	Thu 6/24/04	Thu 7/8/04									
508	Sampling	45 days	Fri 7/9/04	Sun 8/22/04									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
509	SSP Close Out Report	30 days	Mon 8/23/04	Tue 9/21/04									
510													
511	AOC 18 (GP C) - Suspected Underground Storage Tanks	265 days	Thu 1/1/04	Tue 9/21/04									
512	PA/SI Site Screening Process	265 days	Thu 1/1/04	Tue 9/21/04									
513	Desk top audit	60 days	Thu 1/1/04	Sun 2/29/04									
514	Draft Workplan	30 days	Mon 3/1/04	Tue 3/30/04									
515	Army Review	30 days	Wed 3/31/04	Thu 4/29/04									
516	Regulatory review	30 days	Fri 4/30/04	Sat 5/29/04									
517	Response to comments	25 days	Sun 5/30/04	Wed 6/23/04									
518	Final Workplan	15 days	Thu 6/24/04	Thu 7/8/04									
519	Sampling	45 days	Fri 7/9/04	Sun 8/22/04									
520	SSP Close Out Report	30 days	Mon 8/23/04	Tue 9/21/04									
521													
522	AOC 20 (GP C) - Abandoned Water Treatment Plant Near H-413	265 days	Thu 1/1/04	Tue 9/21/04									
523	PA/SI Site Screening Process	265 days	Thu 1/1/04	Tue 9/21/04									
524	Desk top audit	60 days	Thu 1/1/04	Sun 2/29/04									
525	Draft Workplan	30 days	Mon 3/1/04	Tue 3/30/04									
526	Army Review	30 days	Wed 3/31/04	Thu 4/29/04									
527	Regulatory review	30 days	Fri 4/30/04	Sat 5/29/04									
528	Response to comments	25 days	Sun 5/30/04	Wed 6/23/04									
529	Final Workplan	15 days	Thu 6/24/04	Thu 7/8/04									
530	Sampling	45 days	Fri 7/9/04	Sun 8/22/04									
531	SSP Close Out Report	30 days	Mon 8/23/04	Tue 9/21/04									
532													
533	AOC 6 (GP C) - Marine Corps Power Generation	265 days	Thu 1/1/04	Tue 9/21/04									
534	PA/SI Site Screening Process	265 days	Thu 1/1/04	Tue 9/21/04									
535	Desk top audit	60 days	Thu 1/1/04	Sun 2/29/04									
536	Draft Workplan	30 days	Mon 3/1/04	Tue 3/30/04									
537	Army Review	30 days	Wed 3/31/04	Thu 4/29/04									
538	Regulatory review	30 days	Fri 4/30/04	Sat 5/29/04									
539	Response to comments	25 days	Sun 5/30/04	Wed 6/23/04									
540	Final Workplan	15 days	Thu 6/24/04	Thu 7/8/04									
541	Sampling	45 days	Fri 7/9/04	Sun 8/22/04									
542	SSP Close Out Report	30 days	Mon 8/23/04	Tue 9/21/04									
543													
544	AOC 9 (Gp D) - Track A and B Burning Ground	265 days	Sat 1/1/05	Thu 9/22/05									
545	PA/SI Site Screening Process	265 days	Sat 1/1/05	Thu 9/22/05									
546	Desk top audit	60 days	Sat 1/1/05	Tue 3/1/05									
547	Draft Workplan	30 days	Wed 3/2/05	Thu 3/31/05									
548	Army Review	30 days	Fri 4/1/05	Sat 4/30/05									
549	Regulatory review	30 days	Sun 5/1/05	Mon 5/30/05									
550	Response to comments	25 days	Tue 5/31/05	Fri 6/24/05									
551	Final Workplan	15 days	Sat 6/25/05	Sat 7/9/05									
552	Sampling	45 days	Sun 7/10/05	Tue 8/23/05									
553	SSP Close Out Report	30 days	Wed 8/24/05	Thu 9/22/05									
554													
555	AOC 12 (GP D) - Track J Explosive Magazine line (Scars)	265 days	Sat 1/1/05	Thu 9/22/05									
556	PA/SI Site Screening Process	265 days	Sat 1/1/05	Thu 9/22/05									
557	Desk top audit	60 days	Sat 1/1/05	Tue 3/1/05									
558	Draft Workplan	30 days	Wed 3/2/05	Thu 3/31/05									
559	Army Review	30 days	Fri 4/1/05	Sat 4/30/05									
560	Regulatory review	30 days	Sun 5/1/05	Mon 5/30/05									
561	Response to comments	25 days	Tue 5/31/05	Fri 6/24/05									
562	Final Workplan	15 days	Sat 6/25/05	Sat 7/9/05									
563	Sampling	45 days	Sun 7/10/05	Tue 8/23/05									
564	SSP Close Out Report	30 days	Wed 8/24/05	Thu 9/22/05									
565													
566	AOC 8 (GP D) - Track A Explosive Magazine Line (Disposal Pit)	265 days	Sat 1/1/05	Thu 9/22/05									
567	PA/SI Site Screening Process	265 days	Sat 1/1/05	Thu 9/22/05									
568	Desk top audit	60 days	Sat 1/1/05	Tue 3/1/05									
569	Draft Workplan	30 days	Wed 3/2/05	Thu 3/31/05									
570	Army Review	30 days	Fri 4/1/05	Sat 4/30/05									

SMP Master Schedule

ID	Task Name	Duration	Start	Finish	2001		2002		2003		2004		2005
					Qtr 1	Qtr 3	Qtr 1						
571	Regulatory review	30 days	Sun 5/1/05	Mon 5/30/05									
572	Response to comments	25 days	Tue 5/31/05	Fri 6/24/05									
573	Final Workplan	15 days	Sat 6/25/05	Sat 7/9/05									
574	Sampling	45 days	Sun 7/10/05	Tue 8/23/05									
575	SSP Close Out Report	30 days	Wed 8/24/05	Thu 9/22/05									
576													
577	AOC 16 (GP D) - Removed Steam Heating Plant	265 days	Sat 1/1/05	Thu 9/22/05									
578	PA/SI Site Screening Process	265 days	Sat 1/1/05	Thu 9/22/05									
579	Desk top audit	60 days	Sat 1/1/05	Tue 3/1/05									
580	Draft Workplan	30 days	Wed 3/2/05	Thu 3/31/05									
581	Army Review	30 days	Fri 4/1/05	Sat 4/30/05									
582	Regulatory review	30 days	Sun 5/1/05	Mon 5/30/05									
583	Response to comments	25 days	Tue 5/31/05	Fri 6/24/05									
584	Final Workplan	15 days	Sat 6/25/05	Sat 7/9/05									
585	Sampling	45 days	Sun 7/10/05	Tue 8/23/05									
586	SSP Close Out Report	30 days	Wed 8/24/05	Thu 9/22/05									
587													
588	Pesticide Drum Area	422 days	Wed 11/14/01	Mon 1/13/03									
589	Complete Removal Action documentation	422 days	Wed 11/14/01	Mon 1/13/03									
590	Confirmation Sampling	30 days	Wed 11/14/01	Mon 12/17/01									
591	Evaluation of Confirmation Sampling	30 days	Tue 1/15/02	Wed 2/13/02									
592	Draft Close Out Report	30 days	Tue 10/1/02	Wed 10/30/02									
593	Army Review	30 days	Thu 10/31/02	Fri 11/29/02									
594	Regulatory Review	30 days	Sat 11/30/02	Sun 12/29/02									
595	Final Documentation	15 days	Mon 12/30/02	Mon 1/13/03									
596													
597	Land Use Controls for Ordnance and Explosives	302 days	Tue 10/1/02	Tue 7/29/03									
598	Land Use Control Implementation MOAs	302 days	Tue 10/1/02	Tue 7/29/03									
599	City of Suffolk LUC MOA	90 days	Tue 10/1/02	Sun 12/29/02									
600	Continental Properties LUC MOA	90 days	Fri 11/1/02	Wed 1/29/03									
601	GE LUC MOA	90 days	Sun 12/1/02	Fri 2/28/03									
602	TCC LUC MOA	90 days	Wed 1/1/03	Mon 3/31/03									
603	Dominion Lands LUC MOA	90 days	Sat 2/1/03	Thu 5/1/03									
604	HRSD LUC MOA	90 days	Sat 3/1/03	Thu 5/29/03									
605	VDOT LUC MOA	90 days	Tue 4/1/03	Sun 6/29/03									
606	SYSCO SYSTEMS LUC MOA	90 days	Thu 5/1/03	Tue 7/29/03									
607													
608	Ordnance and Explosives Removal	1593 days	Tue 10/1/02	Fri 2/9/07									
609	Complete OE Removals, areas adj. to Pit 18	90 days	Tue 10/1/02	Sun 12/29/02									
610	Complete OE Removals on GE Lands	1473 days	Tue 10/1/02	Thu 10/12/06									
611	Complete close out reporting, PP and ROD	120 days	Fri 10/13/06	Fri 2/9/07									
612													
613	FNOD Hydrologic Conceptual Site Model (CSM)	1021 days	Fri 12/14/01	Wed 9/29/04									
614	Regulatory Review of Work Plan, Sampling Plan etc.	30 days	Fri 12/14/01	Sat 1/12/02									
615	Final Documents	30 days	Sun 1/13/02	Mon 2/11/02									
616	Well installation	30 days	Sun 9/1/02	Mon 9/30/02									
617	Sampling	7 days	Tue 10/1/02	Mon 10/7/02									
618	Data analysis	60 days	Tue 10/8/02	Fri 12/6/02									
619	Draft Report	30 days	Sat 12/7/02	Sun 1/5/03									
620	Army Review	30 days	Mon 1/6/03	Tue 2/4/03									
621	Regulatory Review	30 days	Wed 2/5/03	Thu 3/6/03									
622	Response to comments	25 days	Fri 3/7/03	Mon 3/31/03									
623	Final Well Sampling Reports	15 days	Tue 4/1/03	Tue 4/15/03									
624													
625	Quarterly Water Level Readings	730 days	Tue 10/1/02	Wed 9/29/04									
626													
627	Hydrologic Model Development	547 days	Sun 9/1/02	Sun 2/29/04									
628	Draft Report	90 days	Mon 3/1/04	Sat 5/29/04									
629	Army Review	30 days	Sun 5/30/04	Mon 6/28/04									
630	Regulatory Review	30 days	Tue 6/29/04	Wed 7/28/04									
631	Response to comments	25 days	Thu 7/29/04	Sun 8/22/04									
632	Final Hydrological Report	15 days	Mon 8/23/04	Mon 9/6/04									

SMP Master Schedule

Project: FNOD Master Schedule
 SMP Fiscal Year 2003
 Draft SMP, September 2002

Task		Rolled Up Task		Project Summary	
Split		Rolled Up Split		External Milestone	
Progress		Rolled Up Milestone		External Milestone	
Milestone		Rolled Up Progress		External Milestone	
Summary		External Tasks		Deadline	

**14. CURRENT DEQ AND EPA COMMENTS, USACE
RESPONSES TO COMMENTS**

COMMENTS SUBMITTED BY VIRGINIA DEQ:



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 10009, Richmond, Virginia 23240

Fax (804) 698-4500 TDD (804) 698-4021

www.deq.state.va.us

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

October 17, 2002

Mr. Kenneth W. Hafner
U. S. Army Corps of Engineers – Norfolk District
Attention: CENAO-PM-M
803 Front Street
Norfolk, VA 23510-1096

RE: Former Nansmond Ordnance Depot (FNOD) – Suffolk, Virginia
Review of Draft Site Management Plan (SMP) – Fiscal Year 2003

Dear Mr. Hafner:

Thank you for providing the Department of Environmental Quality – Office of Remediation Programs, the opportunity to review the referenced Draft SMP dated September 27, 2002. Subsequent to our internal review, this office would like to submit the following comments on the referenced document.

Section/Paragraph/Page

A-1[POU-8]/Bullet #6/28: This narrative stated "The USACE has overseen periodic removals of slag as it is exposed, and will retain a contractor to check on the NRB." In an effort to more effectively capture the timeframe of the *periodic removals*, please define the projected frequency in which a USACE contractor would be conducting this activity, along the NRB.

Residential Well Sampling/1/54: This narrative stated "Two previous sampling events of residential water have occurred..." As you are aware, certain constituents (MTBE, nitrates, sodium and fluoride) were detected above MCL's earlier this calendar year in some Respass Beach potable wells. All four of the referenced constituents were determined to be non-FNOD related. Please insert language into this narrative to effectively convey that the DEQ Tidewater Regional Office has initiated an independent investigation due to the presence of MTBE in one residential potable well. Additionally, the DEQ Tidewater Regional Office has offered a form of alternate water supplies to the impacted residence. As you are aware, this resident did not accept DEQ's offer of alternate water supplies.

Should you have any questions with regard to this review, please contact me @ 804/698-4427.

Sincerely,

Handwritten signature of Eric J. Salopek in black ink.

Eric J. Salopek
Project Officer
Office of Remediation Programs

CC: Durwood H. Willis; DEQ-ORP
Milt Johnston; DEQ-TRO
Robert Thomson; USEPA Region III

COMMENTS SUBMITTED BY EPA:

NOTE: EPA submitted concurrence of SMP by email to Ken Hafner, no responses needed.

-----Original Message-----

From: Thomson.Bob@epamail.epa.gov

[<mailto:Thomson.Bob@epamail.epa.gov>]

Sent: Thursday, November 14, 2002 10:24 AM

To: Hafner, Kenneth W

Cc: ejsalopek@deq.state.va.us; Aiken, Richard W;

damiller@deq.state.va.us; Fromme, Cheryl L

Subject: Re: FNOD SMP

The 2003 draft SMP is okay for distribution. I would, however, like to discuss the timing of document submittal for review, as I would like to stagger submittals such that review consists of no more than a maximum of two documents per month. It would be nice to overlap document submittal timeframes for fiscal year 2003 to see how the timing of submittals is distributed.

Rob

RESPONSES TO REGULATOR COMMENTS

Responses to comments submitted 17 Oct 2002 by letter to Ken Hafner

FROM: Eric J. Salopek, Virginia DEQ Office of Remediation Programs
SUBJECT: Draft Site Management Plan, Former Nansemond Ordnance Depot
(FNOD), Fiscal Year 2003, Suffolk, VA

[Section/Paragraph/Page]

1. A-1[POU-8]/Bullet #6/28: This narrative stated “The USACE has overseen periodic removals of slag as it is exposed, and will retain a contractor to check on the NRB.” In an effort to more effectively capture the timeframe of the *periodic removals*, please define the projected frequency in which a USACE contractor would be conducting this activity, along the NRB.

Response: The following text will be added to the section, “The periodic removals will be conducted at a minimum, once every other month, and will be documented in team partnering meetings.”

2. Residential Well Sampling/1/54: This narrative stated “Two previous sampling events of residential water have occurred...” As you are aware, certain constituents (MTBE, nitrates, sodium and fluoride), were detected above MCLs earlier this calendar year in some Respass Beach potable wells. All four of the referenced constituents were determined to be non-FNOD related. Please insert language into this narrative to effectively convey that the DEQ Tidewater Regional Office has initiated an independent investigation due to the presence of MTBE in one residential potable well. Additionally, the DEQ Tidewater Regional Office has offered a form of alternate water supplies to the impacted residence. As you are aware, this resident did not accept DEQ’s offer of alternate water supplies.

Response: The above information will be included in the Residential Well Sampling section.