Final

Record of Decision

Site 6: Small Arms Unit
St. Juliens Creek Annex
Chesapeake, Virginia

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

JULY 2003

Contents

Tables

Figures

Acronyms and Abbreviations

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
BTAG	Biological Technical Assistance Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Estimate and Cost Analysis
ERA	Ecological Risk Assessment
ft	foot, feet
FFA	Federal Facilities Agreement
HHRA	Human Health Risk Assessment
IAS	Initial Assessment Study
IR	Installation Restoration
MCL	maximum contaminant level
NACIP	Naval Assessment and Control of Installation Pollutants
NCP	National [Oil and Hazardous Substances Pollution] Contingency Plan
NFA	no further action
NPL	National Priorities List
NTCRA	non-time-critical removal action
PCBs	Polychlorinated Biphenyls
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RBC	Risk-Based Concentration [criteria]
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation

RI	Remedial Investigation
ROD	Record of Decision
RRR	Relative Risk Ranking
SARA	Superfund Amendments and Reauthorization Act
SIMA	Shore Intermediate Maintenance Activity
SJCA	St. Juliens Creek Annex
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Units
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound
VSI	Visual Site Inspection
yd^3	cubic yards

SECTION 1

Declaration

1.1 Site Name and Location

Site 6, Small Arms Unit
St. Juliens Creek Annex
Chesapeake, Virginia
USEPA ID: VA5170000181

1.2 Statement of Basis and Purpose

This Record of Decision (ROD) presents the determination that no further action (NFA) is necessary to protect human health and the environment at Navy Installation Restoration (IR) designated Site 6, Small Arms Unit, at the St. Juliens Creek Annex (SJCA) in Chesapeake, Virginia. The determination was made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record file for the site.

The United States Department of the Navy (Navy) issues this ROD with concurrence from U.S. Environmental Protection Agency (USEPA) Region III. Additionally, the Commonwealth of Virginia concurs with the Selected Remedy.

1.3 Description of the Selected Remedy

The Selected Remedy for Site 6: Small Arms Unit is NFA. The Selected Remedy was determined based on the evaluation of site conditions, site-related risks, applicable or relevant and appropriate requirements (ARARs), and Remedial Action Objectives (RAOs).

The NFA remedy for Site 6 protects human health, welfare, and/or the environment. A soil removal action was conducted in 2002, which eliminated potentially unacceptable risk associated with contaminated soil at the site. Verification sampling was done after the removal actions and supports the NFA remedial alternative. The Navy may authorize monitoring to verify that no unacceptable exposures to risks posed by the site occur in the future.

1.4 Statutory Determinations

The Selected Remedy of NFA for Site 6 is protective of human health and the environment, complies with federal and state regulations that are applicable or relevant and appropriate to the remedial action, and uses permanent solutions to the maximum extent practicable. Previous response actions have removed impacted soils at the site and post removal

confirmatory sampling results verify adequate removal. These previous actions have eliminated the need to conduct further remedial action at Site 6. None of the CERCLA Section 121 statutory determinations are necessary since no remedy is being selected.

This remedy will not result in hazardous substances, pollutants, or contaminants remaining onsite above levels that restrict unlimited use and unrestricted exposure. Therefore, a 5-year review will not be required for this remedial action.

1.5 Authorizing Signatures

F. F. Aucremanne, CAPT, CEC, USN
Regional Engineer, Acting
By direction of the Commander
Navy Region Mid-Atlantic

Date

Abraham Ferdas, Director
Hazardous Site Cleanup Division
USEPA Region III

Date

SECTION 2

Decision Summary

This ROD describes the Navy's selected remedial action for Site 6, the Small Arms Unit, at the St. Juliens Creek Annex, Chesapeake, Virginia. USEPA and Virginia Department of Environmental Quality (VDEQ) concur with the Selected Remedy. The Navy is the lead agency and provides funding for site cleanups. Site 6 is one of several IR sites located at the SJCA facility.

2.1 Site Name, Location, and History

The SJCA facility is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake in southeastern Virginia (Figure 2-1). The facility covers approximately 490 acres and includes administrative buildings, wharf areas on the Southern Branch of the Elizabeth River, a central heating plant, numerous nonoperational industrial facilities, and miscellaneous structures.

The facility is bordered on the north by the Norfolk and Western Railroad, the City of Portsmouth, and residential areas; on the west by residential areas; on the south by St. Juliens Creek; and on the east by the Southern Branch of the Elizabeth River. Most surrounding areas are developed and include residences, schools, recreational areas, and shipping facilities for several large industries. Some undeveloped areas surround the facility. In August 2000, SJCA was placed on USEPA's National Priorities List (NPL), (VA5170000181).

Site 6, the Small Arms Unit, was operated as part of the ordnance disposal operations at SJCA, and is located in the northeastern portion of the Annex (Figure 2-2). The Small Arms Unit consisted of an 8-ft-wide by 20-ft long by 12-ft-high steel container underlain by a concrete pad, known as the caged pit. Interviews with former employees indicated that small items were transported into a steel container via a conveyor belt for destruction. Historical records do not indicate the dates of operation. A review of historical aerial photographs indicates that activities associated with Site 6 likely began around 1949 and continued through the 1980s. According to the Phase II Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) report (March 1989), an unknown volume of small items, such as igniters and fuses, were burned in the unit. The RFA also reported that the Navy had filled in the area "during recent years." Due to its proximity to Site 5, Site 6 was investigated during the remedial investigation (RI) as part of Site 5, the Burning Grounds (refer to Section 2.2.1.4 of this ROD).

2.2 Previous Investigations and Enforcement Activities

2.2.1 Previous Investigations

Sections 2.2.1.1 through 2.2.1.6 summarize previous investigations conducted at Site 6, the Small Arms Unit, at SJCA.

2.2.1.1 Initial Assessment Study

In 1981, the Navy conducted the Initial Assessment Study (IAS) as part of the Naval Assessment and Control of Installation Pollutants (NACIP) Program. The purpose was to qualitatively identify and assess sites that posed a potential threat to human health or the environment as a result of contamination from past handling of (and operations involving) hazardous materials. The results determined that low-level concentrations of ordnance materials existed throughout the facility; however, the identified sites, including Site 6, were determined not to pose a threat to human health and the environment, and no confirmation study was conducted.

2.2.1.2 Phase II RCRA Facility Assessment

A.T. Kearney, Inc., and K.W. Brown and Associates, Inc., prepared a Phase II RFA in 1989. The RCRA Facility Assessment (RFA) included a preliminary review of all available relevant documents and a visual site inspection (VSI) of 34 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). No sampling was conducted during the RFA. The RFA recommended that further investigation at Site 6 be combined with any RCRA Facility Investigation (RFI) activities at Site 5.

2.2.1.3 Relative Risk Ranking System Data Collection Report

CH2M HILL submitted a Relative Risk Ranking (RRR) System Data Collection Report for the SJCA to the Navy in April 1996. The sampling effort's goal was to gather data for the Navy to perform assessments of the sites using the Navy's RRR System. One surface soil sample was collected from Site 6 at up to 1-ft deep. With the exception of three pesticides and one metal, the detected compounds were at concentrations below background levels.

2.2.1.4 Remedial Investigation

Remedial Investigation (RI) activities were conducted from 1997 through 2003. Because Site 6 covers a small area and is located near Site 5, the Site 6 RI was conducted as part of the Site 5 RI and included with the RI documentation for Sites 3, 4, 5, and 6. Surface soil was the primary medium of concern at Site 6; Site 6 surface water, sediment, and groundwater were investigated as part of Site 5. The nature and extent of contamination, as well as the likely fate and transport of contaminants, were characterized during the RI and are discussed in this ROD in Section 2.5.3. A baseline Human Health Risk Assessment (HHRA) was conducted to evaluate the potential human health risks associated with the presence of site-related soil, surface water, sediment, and deep- and shallow-groundwater contamination at Sites 5 and 6 (refer to Section 2.7.1 of this ROD). Additionally, a screening Ecological Risk Assessment (ERA) was conducted to evaluate the potential ecological risks to terrestrial and aquatic receptors (refer to Section 2.7.2 of this ROD).

Given that Site 6 is a very small area where remnants of the Small Arms Unit were believed to be buried, the Navy, USEPA, and the Commonwealth of Virginia agreed that complete removal of the caged pit and associated potential risk from exposure to soil at Site 6 was warranted.

2.2.1.5 Engineering Evaluation/Cost Analysis

During the RI, an Engineering Evaluation and Cost Analysis (EE/CA) was performed in 2002 in accordance with USEPA and Navy guidance for a non-time-critical removal action (NTCRA) under CERCLA. The purpose was to identify and analyze remedies or removal actions to mitigate potential risk at Site 6. Three alternatives were identified, evaluated, and ranked. Based on the comparative analyses of the removal alternatives, the selected interim removal action involved excavation, disposal characterization, and disposal of the remnants of the caged unit at Site 6. This alternative would eliminate the potential risk related to Site 6 and was most protective of human health and the environment. The material and soil volume to be removed was estimated to be 60 cubic yards (yd^3). Confirmatory samples were to be collected from the remaining soils at the sides and bottom of the excavated areas to verify that cleanup goals were met.

2.2.1.6 Site 6 Interim Soil Removal Action / Action Memorandum

The Navy prepared an action memorandum for Site 6 and awarded the Interim Removal Action to OHM Remediation Services Corporation (OHM/SHAW) of Virginia Beach, Virginia. Removal activities took place in September 2002.

The extent of excavation at Site 6 was defined based on soil-sampling results and geophysical survey data collected as part of the RI and previous investigations. All remnants of the concrete caged unit and associated soil, which amounted to approximately 180 yd^3, were removed during the NTCRA.

Because all Site 6 surface soils were excavated, groundwater and subsurface soil remained the only media of concern. Following the removal at Site 6, the groundwater and subsurface soil confirmatory sampling results were collected to confirm the removal of the potential risks posed to human health and ecological receptors. The confirmatory sampling results indicated no remaining risk at Site 6 (refer to Sections 2.5.3.2, 2.7.1, and 2.7.2 of this ROD).

2.2.2 Enforcement Activities

SJCA was placed on the NPL in August 2000. No enforcement activities have been recorded to date at Site 6.

2.3 Community Participation

The SJCA Restoration Advisory Board (RAB) was formed in 1994. Meetings continue to be held to provide an information exchange among community members, the USEPA, the Commonwealth of Virginia, and the Navy. These meetings are open to the public. A community relations program is being conducted through the IR Program process. Public input is a key element in the decisionmaking process.

In accordance with Sections 113 and 117 of CERCLA, the Navy provided a public comment period from June 3 through July 3, 2003, for the Proposed Plan for Site 6. The public notice appeared in *The Virginian-Pilot* newspaper on May 18, 2003. The Proposed Plan for Site 6 and Final RI/HHRA/ERA for Sites 3, 4, 5, and 6 are available to the public in the Administrative Record and information repository maintained at:

Major Hillard Library
824 Old George Washington Hwy. N
Chesapeake, Virginia 23323
(757) 382-3600

A public meeting to present the NFA Proposed Plan for Site 6 was held on June 10, 2003, at the Major Hillard Library. Public notice of the meeting and availability of documents was placed in *The Virginian Pilot* newspaper on May 20, 2003.

No verbal or written comments, concerns, or questions were received by the Navy, the USEPA, or the Commonwealth of Virginia during the public comment period.

2.4 Scope and Role of Response Actions

SJCA was listed on the NPL in August 2000. The Navy acts in partnership with the USEPA and the Commonwealth of Virginia to conduct environmental investigations at the facility through the IR Program. A list of all IR sites can be found in the current version of the Site Management Plan, which is located in the Administrative Record. The Site Management Plan contains the location, description, contaminants of concern, and cleanup status of each site. Site 6 is included in the Site Management Plan. The Navy is currently preparing a Federal Facilities Agreement (FFA) for use by the Navy, USEPA, and the Commonwealth of Virginia. Under the FFA, all past and future work at IR sites, SWMUs, and AOCs will be reviewed and a course of action for future work requirements at each will be developed. The FFA will include specific requirements for the preparation and contents of a Site Management Plan.

All documentation related to Site 6, as well as other IR sites, is provided in the Administrative Record. This site is not part of a larger operable unit and only consists of soil at Site 6. Based upon verification sampling completed after the removal, the site does not pose an unacceptable risk to human and/or ecological receptors.

2.5 Site Characteristics

2.5.1 Physical Setting

Site 6, the Small Arms Unit, currently consists of a small, open, grass-covered area east of Craddock Street in the facility's northern portion (refer to Figures 2-1 and 2-2). The site is not used for any facility activities and does not contain buildings. The site is relatively flat with a surface elevation of approximately 8 feet above mean sea level. The surrounding land is open grassland with Site 5, the Burning Grounds, to the west.

Groundwater at the site ranges seasonally between 3 and 9 feet below ground surface and flows toward nearby surface water bodies (i.e., Blows Creek to the south and the Southern Branch of the Elizabeth River to the southeast) and the low-lying marsh area between Site 5 and Blows Creek. Site 6 groundwater was characterized in the RI as part of Site 5. Surface water runoff from Site 6 flows west to the nearby surface water bodies and through a drainage swale to the Site 5 marsh area.

2.5.2 Conceptual Model

As previously noted, Site 6 was investigated as part of Site 5 because of its size, proximity to Site 5, and potential influence on media shared with Site 5. Consequently, groundwater, surface water, and sediment samples were not specifically collected at Site 6 during the RI. (However, a confirmatory groundwater sample was collected at Site 6 as part of the NTCRA, as described in Section 2.7.1). Primary fate-and-contaminant migration pathways for constituents of concern at Sites 5 and 6 were examined, including their dissolution and suspension in sediment and surface water, leaching into shallow groundwater, discharge in groundwater to surface water, and transport to deep groundwater. The RI determined that the transport of constituents through surface runoff and erosion from Site 6 was expected to be minimal. The conceptual model used for the HHRA, which illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential receptors at Sites 5 and 6, is provided as Figure 2-3 (also refer to Section 2.7.1). The conceptual model used for the ERA for Sites 3, 4, 5, and 6 is provided as Figure 2-4 (also refer to Section 2.7.2).

2.5.3 Nature and Extent of Contamination

2.5.3.1 Pre-Removal Action

Constituents identified in surface soil reflective of potential impacts from Site 6 were barium and zinc, which were present at concentrations greater than background. Barium exceeded the risk-based screening criteria for human health. Both barium and zinc exceeded the screening criteria (Biological Technical Assistance Group [BTAG] soil flora/fauna) for ecological receptors.

No subsurface soil constituents reflected potential impacts from Site 6. Arsenic and iron were detected at concentrations that exceeded the residential human health screening criteria; however, neither exceeded background concentrations. One volatile organic compound (VOC) and three semivolatile organic compounds (SVOCs) were detected in subsurface soil but none exceeded its respective background concentrations or residential human health-screening criteria.

Arsenic and iron, though not identified as potentially impacting Site 6, were identified in the RI as a potential human health risk in soil. The screening ERA identified several inorganics, pesticides, polychlorinated biphenyls (PCBs), SVOCs, and explosives that posed a potential risk to ecological receptors. The RI presents a detailed summary of the risks determined by the baseline HHRA and the screening ERA.

2.5.3.2 Post-Removal Action

All surface soil was removed from Site 6 during the 2002 Site 6 Soil Interim Removal Action and replaced with clean fill. Therefore, there are no human health or ecological risks associated with surface soil at Site 6. Soils were excavated to approximately 7-feet deep in the center of the excavation while the outer edges were excavated to 1 foot. A confirmatory subsurface soil sample collected at 3 feet at Site 6 showed that arsenic and iron in the subsurface soil were below background concentrations. Therefore, Site 6 activities have not impacted subsurface soil.

The Site 6 Closeout Report and Site 3 Removal Summary (CH2M HILL, March 2003) presents a summary of the Site 6 Removal Action and closeout activities.

2.6 Current and Potential Future Site and Resource Uses

Site 6 and the adjacent IR Sites 3, 4, and 5 are located within a fenced area not accessible to trespassers. The sites are currently unused; however, a communications and/or radar facility is located nearby in the northeastern area of Site 3.

Site 6 consists of clean fill covered by grass (as a result of the Soil Removal Action). Nearby surface water is not used for swimming as it is shallow and the base is secured; however, future trespassers may potentially wade in these areas and contact both surface water and sediment. Neither the shallow nor deep groundwater beneath Site 6 is currently used as a potable water supply. Private deep wells exist locally, at least 1.5 miles outside of SJCA within the cities of Chesapeake and Portsmouth, that are permitted for irrigation. Shallow groundwater is not currently used near the site.

The area immediately surrounding Site 6 consists of IR Sites 3, 4, and 5; Blows Creek; and buildings that support base activities. Such activities take place to the west and south of Site 6 and include administrative activities, an active Defense Reutilization and Marketing Office (DRMO), a Shore Intermediate Maintenance Activity (SIMA), and storage. There is currently no planned future land use at Site 6 and the surrounding area, but industrial or commercial use is anticipated. Future residential development of the site is unlikely; however, residential scenarios were evaluated in the Site 5/6 baseline HHRA to be conservative. If the site is developed for residential use, it is possible that deep groundwater could be used as a potable water supply.

2.7 Summary of Site Risks

This section examines the current risks associated with Site 6 following the removal of soil and the remnants of the caged unit. Media of concern at Site 6 are subsurface soil and groundwater (since the surface soil was removed during the Site 6 Soil Removal Action in 2002). A more-detailed discussion of risk previously found at Site 6 can be found in the Final RI for SJCA Sites 3, 4, 5, and 6 (CH2M HILL, 2003) and in the Site 6 Closeout Report and Site 3 Removal Summary (CH2M HILL, 2003). Table 2-1 summarizes the risk assessment results for Site 6. Section 2.7.1 discusses the human health risks associated with Site 6 and Section 2.7.2 discusses its associated ecological risks. No remedial action is necessary to ensure protection of human health and the environment based on previous removal actions and post removal confirmatory sampling at Site 6. The basis for the conclusion that unacceptable exposures to hazardous substances at Site 6 will not occur is demonstrated in the following sections.

TABLE 2-1
Site 6 Risk Assessment Results Summary

Media	Human Health Risk	Ecological Risk
Surface Soil	Within acceptable limits	Within acceptable limits
Subsurface Soil	Within acceptable limits	Not evaluated
Groundwater	Within acceptable limits [a]	Not evaluated

[a]Noncarcinogenic risk based on future use as drinking water source.

2.7.1 Human Health Risk Summary

There are no human health risks associated with Site 6 as all surface soil has been removed and replaced with clean soil fill. A subsurface soil sample was collected from its excavation floor, following removal of the remnants of the caged unit. Arsenic and iron were detected in subsurface soil as parameters that posed a potential human health risk prior to the removal action, as identified in the RI. The confirmatory sample results for these compounds were below background concentrations. Therefore, Site 6 activities have not impacted subsurface soil.

Although Site 6 groundwater was not considered a risk in the RI, one groundwater sample was collected from the excavation. There were no exceedances of the Federal Drinking Water Maximum Contaminant Level (MCL) for any chemicals in the Site 6 groundwater sample. The results were below the maximum, and for most parameters, even below the mean groundwater concentrations reported in the RI for Sites 5 and 6, where no human health risks were identified for shallow groundwater. Although total arsenic and total and dissolved manganese concentrations exceeded the USEPA Region III adjusted tap water risk-based concentration (RBC) criteria, concentrations were less than those reported for upgradient groundwater in this dredged-filled portion of SJCA, and were consistent with concentrations reported for facilitywide background groundwater (CH2M HILL, 2001). These data show that historical activities at Site 6 have not impacted groundwater.

2.7.2 Ecological Risk Summary

All surface soil has been removed from Site 6 and, therefore, no ecological risk to terrestrial receptors exists.

No constituents were detected in the groundwater sample collected following the 2002 Site 6 Soil Removal Action at concentrations exceeding ecological surface-water risk screening values. An ERA of Blows Creek, a receiving body for Site 6 groundwater and surface water, is planned for 2003; however, it has been determined that activities at Site 6 have not affected groundwater beneath the site.

2.8 Documentation of Significant Changes

The Proposed Plan for Site 6 at SJCA, Chesapeake, Virginia, was released for public comment on June 3, 2003. The Proposed Plan identified NFA as the preferred alternative. No comments were received from the public during the public comment period. It was determined that no significant changes were necessary or appropriate to the remedy originally identified in the Proposed Plan.

File Path: v:\18gis\st-juliens\figures\sites3-6_ri.apr

LEGEND

Site Boundary
Activity Boundary

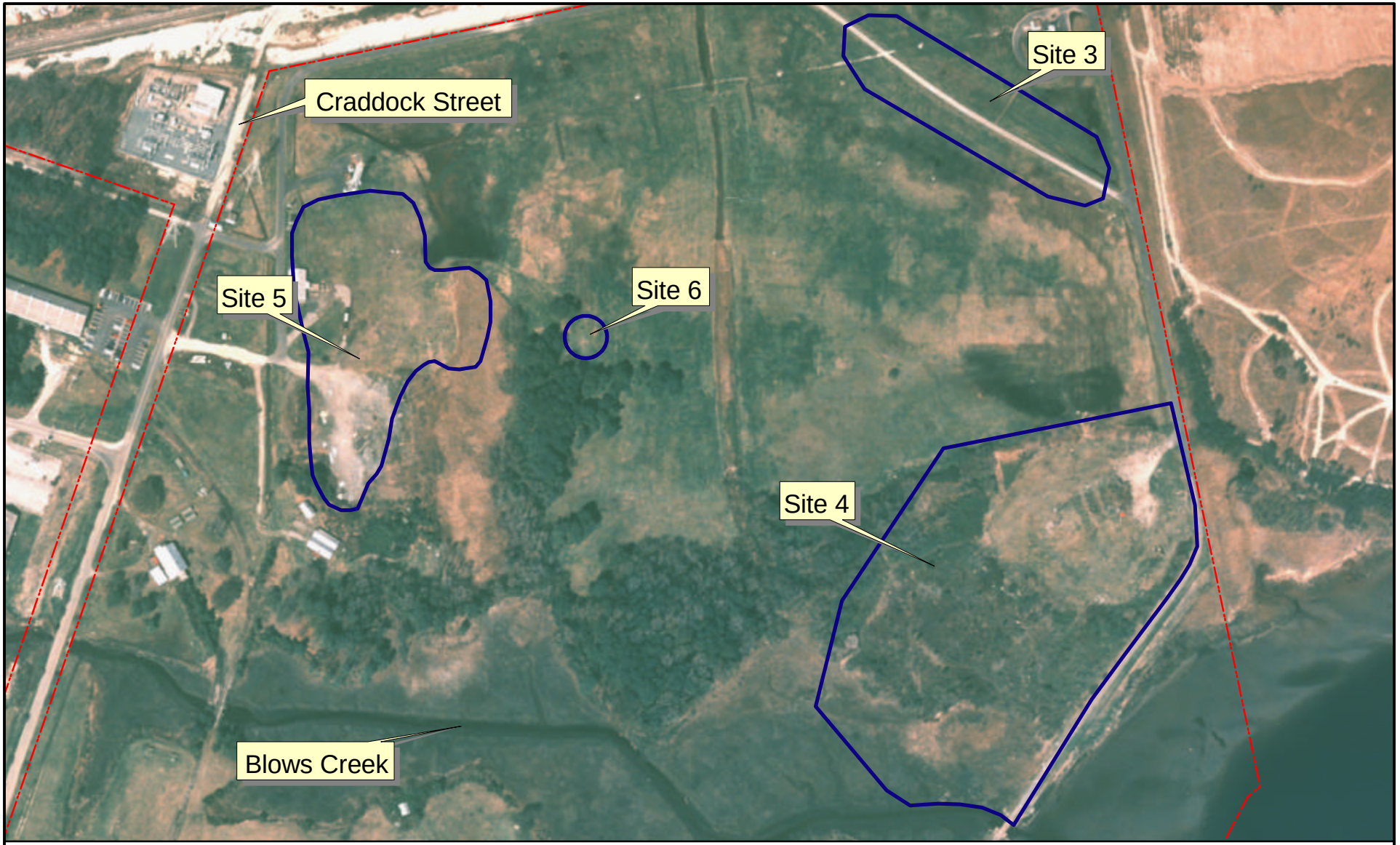
N

0 800 1600 Feet

Figure 2-1
Base Location Map
Site 6 ROD
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

File Path: v:\18gis\st-juliens\figures\sites3-6_ri.apr



LEGEND

Site Boundary

N

200 0 200 Feet

Figure 2-2
Site Location Map
Site 6 ROD
St. Juliens Creek Annex
Chesapeake, Virginia

CH2MHILL

Figure 2-3
Conceptual Exposure Model
Human Health Risk Assessment
Site 5/6
St. Juliens Creek Annex
Chesapeake, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection or Exclusion of Exposure Pathway
Current / Future	Surface Soil	Surface Soil	At Site 5	Trespasser	Adult	Dermal	Onsite	Trespassers may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Trespassers may incidentally ingest soil
					Adolescent	Dermal	Onsite	Trespassers may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Trespassers may incidentally ingest soil
		Air	Emissions from Surface Soil at Site 5	Trespasser	Adult	Inhalation	Onsite	Trespassers may inhale volatiles/particulates
					Adolescent	Inhalation	Onsite	Trespassers may inhale volatiles/particulates
	Groundwater	Deep Groundwater	Tap Water	Resident	Adult	Dermal	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
						Ingestion	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
					Child	Dermal	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
						Ingestion	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
					Adult/Child	Dermal	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
						Ingestion	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
		Air	Deep Groundwater - Water Vapors at Showerhead	Resident	Adult	Inhalation	Offsite	Local municipality currently has some uses for groundwater from deep aquifer
	Surface Water [2]	Surface Water [2]	Drainage Features and Tributary to Blows Creek	Trespasser	Adult	Dermal	Onsite	Trespassers may have exposed skin surfaces come into contact with surface water
					Adolescent	Dermal	Onsite	Trespassers may have exposed skin surfaces come into contact with surface water
	Sediment [2]	Sediment [2]	Drainage Features and Tributary to Blows Creek	Trespasser	Adult	Dermal	Onsite	Trespassers may have exposed skin surfaces come into contact with sediment
						Ingestion	Onsite	Trespassers may incidentally ingest sediment
					Adolescent	Dermal	Onsite	Trespassers may have exposed skin surfaces come into contact with sediment
						Ingestion	Onsite	Trespassers may incidentally ingest sediment

Figure 2-3
Conceptual Exposure Model
Human Health Risk Assessment
Site 5/6
St. Juliens Creek Annex
Chesapeake, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil[1]	Soil[1]	At Site 5	Resident	Adult	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Residents may incidentally ingest soil
					Child	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Residents may incidentally ingest soil
					Adult/Child	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Residents may incidentally ingest soil
				Construction Worker	Adult	Dermal	Onsite	Workers may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Workers may incidentally ingest soil
				Other Worker	Adult	Dermal	Onsite	Workers may have exposed skin surfaces come into contact with soil
						Ingestion	Onsite	Workers may incidentally ingest soil
		Air	Emissions from Soil at Site 5	Construction Worker	Adult	Inhalation	Onsite	Workers may inhale volatiles/particulates
	Surface Water [2]	Surface Water [2]	Drainage Features and Tributary to Blows Creek	Resident	Adult	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with surface water
					Child	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with surface water
					Adult/Child	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with surface water
	Sediment [2]	Sediment [2]	Drainage Features and Tributary to Blows Creek	Resident	Adult	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with sediment
						Ingestion	Onsite	Residents may incidentally ingest sediment
					Child	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with sediment
						Ingestion	Onsite	Residents may incidentally ingest sediment
					Adult/Child	Dermal	Onsite	Residents may have exposed skin surfaces come into contact with sediment
						Ingestion	Onsite	Residents may incidentally ingest sediment
	Groundwater	Shallow Groundwater	Water Table	Construction Worker	Adult	Dermal	Onsite	Workers may have exposed skin surfaces come into contact with groundwater

[1] Includes both surface soil and subsurface soil.

[2] Surface water and sediment exposure scenarios are for waders.

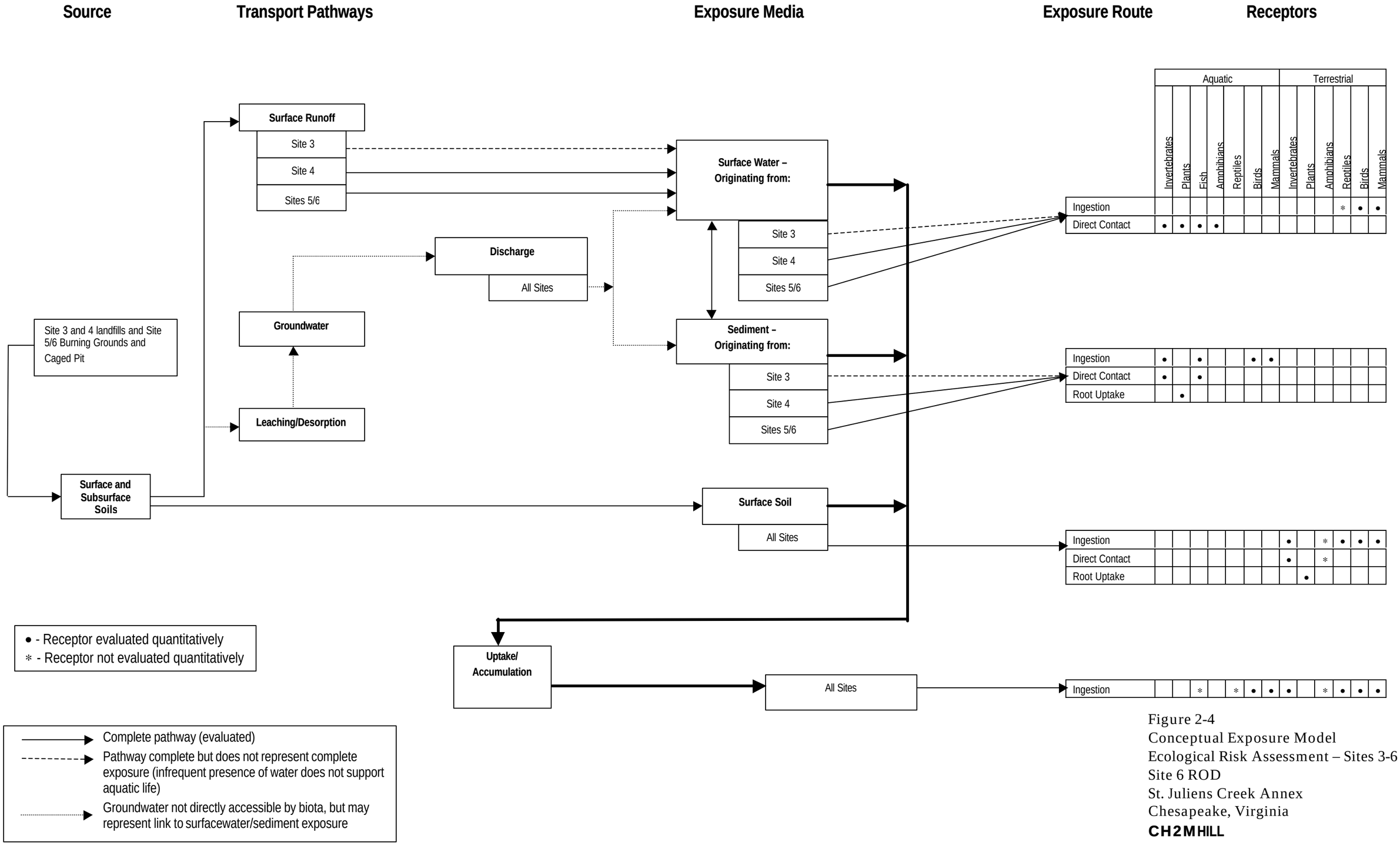


Figure 2-4
Conceptual Exposure Model
Ecological Risk Assessment – Sites 3-6
Site 6 ROD
St. Juliens Creek Annex
Chesapeake, Virginia
CH2MHILL

SECTION 3

Responsiveness Summary

In accordance with Sections 113 and 117 of CERCLA, the Navy provided a public comment period from June 3, 2003, through July 3, 2003, for the Proposed Plan for Site 6. Public input is a key element in the decisionmaking process. The Proposed Plan and Final RI/HHRA/ERA are available to the public in the Administrative Record and information repository maintained at:

Major Hillard Library
824 Old George Washington Hwy N
Chesapeake, Virginia 23323
(757) 382-3600

Public notice of the meeting and availability of documents was placed in *The Virginian-Pilot* newspaper on May 18, 2003. The only participants in the Public Meeting, held on June 10, 2003, were representatives of the Navy, USEPA, and the Commonwealth of Virginia.

No written or verbal public comments, concerns, or questions were received during the public comment period by the Navy, USEPA, or the Commonwealth of Virginia.

SECTION 4

References

A.T. Kearney, Inc. Phase II RCRA Facility Assessment of the St. Juliens Creek Annex Facility. Chesapeake, Virginia. USEPA Contract 68-01-7038. Work Assignment R03-08-44. 1989.

CH2M HILL, Inc. Final Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment for Sites 3, 4, 5, & 6. St. Juliens Creek Annex, Chesapeake, Virginia. Contract N62470-95-D-6007. CTO-0027. March 2003.

CH2M HILL, Inc. Final Action Memorandum for Sites 3 & 6. St. Juliens Creek Annex, Chesapeake, Virginia. Contract N62470-95-D-6007. CTO-0028. August 2002.

CH2M HILL, Inc. Final Site 6 Closeout Report and Site 3 Removal Summary. St. Juliens Creek Annex, Chesapeake, Virginia. Contract N62470-95-D-6007. CTO-0028. March 2002.

CH2M HILL, Inc. Final Engineering Evaluation/Cost Analysis for Sites 3 and 6. St. Juliens Creek Annex, Chesapeake, Virginia. Contract N62470-95-D-6007. CTO-0028. June 2002.

CH2M HILL, Inc. Final Background Investigation Report. St. Juliens Creek Annex, Chesapeake, Virginia. Contract N62470-95-D6007. CTO-150. October 2001.

Navy Engineering and Environmental Support Activity. Navy Assessment and Control of Installation Pollutants: Initial Assessment Study of St. Juliens Creek Annex. Norfolk Naval Shipyard. Portsmouth, Virginia. NEESA 13-001. August 1981.

U.S. Environmental Protection Agency (USEPA). A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents. USEPA 540-R-98-031, OSWER 9200.1-23P, PB98-963241. July 1999.