APPENDIX C

2003 ENVIRONMENTAL ASSESSMENT

FOR MAINTENANCE DREGDING OF THE SKIFFES CREEK CHANNEL

ENVIRONMENTAL ASSESSMENT 2003

Final

Environmental Assessment for the Maintenance Dredging of the Skiffes Creek Channel and the MARAD Facility Access Channel

Fort Eustis, Virginia

Prepared by

US Army Corps of Engineers
Norfolk District

with technical assistance from
Tetra Tech, Inc.
Fairfax, VA 22030

January 2003

ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) addresses potential environmental effects of the proposed dredging of Skiffes Creek Channel and the U.S. Maritime Administration (MARAD) Facility Access Channel, as required by Army Regulation 200-2 *Environmental Effects of Army Actions* and the National Environmental Policy Act.

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An ***EXECUTIVE SUMMARY*** briefly describes the proposed action, environmental consequences, and mitigation measures.

SECTION 1.0: ***PURPOSE AND NEED FOR THE PROPOSED ACTION*** summarizes the purpose of and need for the proposed action and describes the scope of the environmental analysis process.

SECTION 2.0: ***DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES*** describes the proposed action to dredge the Skiffes Creek Channel and the MARAD Facility Access Channel, and to expand the FEDMMA, as well as the no action alternative.

SECTION 3.0: ***AFFECTED ENVIRONMENT*** describes the existing environmental setting at Fort Eustis, Virginia.

SECTION 4.0: ***ENVIRONMENTAL CONSEQUENCES*** identifies the potential effects of implementing the proposed action and of the no action alternative.

SECTION 5.0: ***FINDINGS AND CONCLUSIONS*** summarizes the potential environmental effects.

SECTION 6.0: ***REFERENCES*** provides bibliographical information for cited sources.

SECTION 7.0: ***PERSONS CONSULTED*** provides a listing of persons and agencies consulted during preparation of this EA.

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- ***H*** Record of Non-Applicability (RONA) and Air Quality Model

ACRONYMS AND ABBREVIATIONS

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Finding of No Significant Impact
For the Maintenance Dredging of the Skiffes Creek Channel and the MARAD Facility Access Channel
Fort Eustis, Virginia

Pursuant to the Council on Environmental Quality Regulations (40 CFR Parts 1500-1508) for implementing the procedural provisions of the National Environmental Policy Act (42 U.S.C. 4321 et seq.) and Army Regulation 200-2 (*Environmental Effects of Army Actions*), an Environmental Assessment (EA) was prepared by the U.S. Army Corps of Engineers, Norfolk District, for the U.S. Army Transportation Center and Fort Eustis, to evaluate the potential environmental and socioeconomic effects associated with the proposed dredging project at Fort Eustis, Virginia.

Proposed Action

The Army proposes to dredge two unconnected but neighboring navigation channels accessing facilities on the eastern shoreline of the James River, Virginia and raise the dikes of the Fort Eustis Dredged Material Management Area (FEDMMA). Approximately 680,000 cubic yards of material would be dredged. The dredged material would be disposed of in the existing dredged material disposal area located on Fort Eustis. This proposed action is the Army's preferred alternative.

The purpose of the proposed action is to provide adequate access for vessels using the Third Port and servicing the James River Reserve Fleet, and to accommodate the volume of dredged material to be disposed of during this and foreseeable future dredging operations. Implementation of the proposed action would support the Army's need to maintain its capability to conduct Army and joint Logistics Over The Shore (LOTS) operations. This capability can be achieved only by developing and maintaining soldiers' proficiency in the port activities of loading and unloading military equipment and supplies from oceangoing ships. Implementation of this action would also support the MARAD's mission to maintain the James River Reserve Fleet in a 30-day stand-by status for use in the event of a national mobilization for war.

Alternatives Considered

The Army identified three alternative disposal sites to the proposed action, Craney Island, overboard disposal in the James River, and at another site on Fort Eustis. Under the Craney Island alternative, the Army would dispose of the dredged material in the Craney Island Disposal Facility located in the southern portion of the Chesapeake Bay. The dredged material would be placed in a barge, towed approximately 20 miles to Craney Island, and pumped from the barge into the disposal facility. This would increase dredging and material disposal costs by as much as 100 percent. More importantly, the two channels proposed for dredging are considered outside the Hampton Roads area and thus the dredged material is not eligible to be placed in Craney Island, per the Craney Island authorization documents. Because of these reasons, use of the Craney Island Disposal Facility is not considered feasible and is not examined further in this EA. Under the

overboard disposal alternative, the Army would dump the dredged material into currently designated overboard areas of the James River. The impacts associated with overboard disposal would be similar to those resulting from dredging operations, except that the affected area would be larger since confinement is not technically feasible. The most obvious and most significant impact from overboard disposal would be direct burial and suffocation of benthic organisms. Numerous studies have shown that benthic organisms recover in 1-2 years after placement of dredged material. Overboard placement of dredged material in the James River occurs approximately every 5 years for material dredged from the nearby Tribell Shoal on the James River Federal Navigation Project. This designated overboard site does not have the capacity for the placement of any additional material from other project channels. Therefore, overboard disposal is not considered technically feasible and is not further evaluated in this EA. Under the other sites on Fort Eustis alternative, the Army would dispose of the dredged material at another upland location on Fort Eustis. An Environmental Assessment entitled "Maintenance Dredging, Skiffes Creek, Fort Eustis, Virginia", prepared by the Norfolk District Corps of Engineers in August 1988, assessed the feasibility of disposing of the dredged material on the installation at the golf course, the horseback riding facility, and at training sites south of Back River Road. These alternative locations and others at Fort Eustis, previously studied by the U.S. Army Waterways Experiment Station (Miscellaneous Paper GL-87-2, July 1987) were again determined to be neither fiscally nor technically feasible nor compatible with the Fort Eustis mission or Master Plan, and therefore are not evaluated further in this EA.

The CEQ regulations prescribe including a no action alternative, which serves as a benchmark against which proposed actions can be evaluated. The no action alternative assumes the Army would not dredge either channel.

Factors Considered in Determining that No Environmental Impact Statement is Required

The EA, which is incorporated by reference into this Finding of No Significant Impact, examined potential direct, indirect, and cumulative effects of the proposed action and the no action alternative on 15 resource areas of environmental and socioeconomic concern. The Army found that certain environmental and socioeconomic resources and conditions (land use, geology and soils, air space, transportation resources, utilities, cultural resources, socioeconomics, environmental justice, protection of children, solid waste, and hazardous and toxic substances) would not be affected by the proposed action. Implementation of the proposed action would result in short-term minor adverse effects on air quality, noise, water resources, and biological resources.

Conclusion

Based on the results of the EA, it has been determined that implementation of the proposed action will have no significant direct, indirect or cumulative effects on the quality of the natural or human environment. Therefore, an Environmental Impact Statement is not required and will not be prepared.

Public Comment

Interested parties are invited to review and comment on this FNSI and EA within 15 days of publication of the Notice of Availability in the *Daily Press.* Copies of the EA are available in the Internet at http://www.nao.usace.army.mil/ under "Studies and Projects/Current Studies and Projects". Comments should be addressed to Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PM-E, 803 Front Street, Norfolk, Virginia 23510-1096 (Email: richard.j.muller@usace.army.mil).

Date:_____

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Environmental Assessment
For the Dredging of Skiffes Creek and the MARAD Facility Channel,
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ENVIRONMENTAL ASSESSMENT

LEAD AGENCY: U.S. Army Transportation Center and Fort Eustis

TITLE OF THE PROPOSED ACTION: Maintenance Dredging of the Skiffes Creek Channel and the MARAD Facility Access Channel, Fort Eustis, Virginia

AFFECTED JURISDICTION: City of Newport News, Virginia

PREPARED BY: U.S. Army Corps of Engineers, Norfolk District

APPROVED BY: E. Douglas Earle, Colonel, TC, Garrison Commander, Fort Eustis, Virginia

ABSTRACT: This Environmental Assessment (EA) considers actions required as a result of maintenance dredging the Skiffes Creek Channel and the U.S. Maritime Administration (MARAD) Facility Access Channel. The Army and MARAD propose to remove approximately 680,000 cubic yards of material from the existing channels. The dredging will be to approved connecting depths in the James River. The dredged material will be placed in the Fort Eustis Dredged Material Management Area (FEDMMA) an upland dredged material placement area on Fort Eustis. It will be necessary for the Army to expand the volumetric capacity of the FEDMMA to accommodate additional dredged material by raising the containment dikes from their present elevation of approximately +20 feet m.s.l. to approximately +30 feet m.s.l. This EA considers two main alternatives, the proposed action and no action. One other alternative, dredging with disposal at alternative locations, was considered. This was dismissed as not fiscally or technically feasible, nor environmentally desirable, and is not further evaluated in detail in this EA. Implementation of the no action alternative would involve continuation of current operations. Implementation of the proposed action is not expected to result in significant environmental effects. Therefore, preparation of an Environmental Impact Statement is not required and a Finding of No Significant Impact will be published in accordance with Army Regulation 200-2, *Environmental Effects of Army Actions*, and the National Environmental Policy Act.

REVIEW COMMENT DEADLINE: Comments may be provided to Mr. Richard Muller by mail at the U.S. Army Corps of Engineers, Norfolk District, (ATTN: CENAO-PM-E), 803 Front Street, Norfolk, Virginia 23510-1096; by email at richard.j.muller@usace.army.mil; or by facsimile at 757-441-7875. Comments on this EA must be received within 30 days of the date of publication.

EXECUTIVE SUMMARY

INTRODUCTION

This Environmental Assessment (EA) identifies, documents, and evaluates the potential environmental effects associated with the dredging project at Fort Eustis, Virginia and those associated with a no action alternative. The document has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) Implementing Regulations, and Army Regulation (AR) 200-2. The purpose of this document is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives.

PROPOSED ACTION

The Army proposes to conduct maintenance dredging for two unconnected but neighboring navigation channels accessing facilities on the eastern shoreline of the James River, Virginia. The dikes on the FEDMMA would be raised to accommodate the dredged material. The more northern channel is Skiffes Creek, which provides access to Third Port, Fort Eustis, Virginia, and the southern channel provides access to the U.S. Maritime Administration (MARAD) Facility in Newport News, Virginia. Dredged material would be placed within the 80-acre FEDMMA. This area was last used in January 1994 when approximately 290,000 cubic yards of material were pumped into the site from Skiffes Creek. In order to accommodate the dredged material, the dike walls would be raised from +20 feet m.s.l. to +30 feet m.s.l.

The Army estimates 680,000 cubic yards of silty sand/sandy clay material would need to be removed from the two channels. Dredging will be accomplished by hydraulic means and dredged material would be hydraulically pumped to the FEDMMA.

The dredging activities at the two channels would take approximately one year.

ALTERNATIVES

Alternative Disposal Sites

Three alternative disposal sites, Craney Island, the James River (overboard disposal), and at another site on Fort Eustis, were evaluated. These were determined to be neither economically nor environmentally feasible, and are not evaluated further in this EA.

No action alternative

This document refers to the continuation of existing conditions of the affected environment, without implementation of the proposed action, as the no action alternative. The Council on Environmental Quality (CEQ) regulations prescribe including a no action alternative, which serves as a baseline against which the impacts of the proposed action and alternatives can be evaluated. Under the no action alternative, the Army would not dredge the two channels. Discontinued maintenance of the two channels would result in the continued reduction in operational depth of the navigation channels. Eventually the channels would reach hydrodynamic equilibrium as determined by the tidal and fluvial currents of Skiffes Creek and the James River. This depth would approximate the adjacent bathymetry of the James River and would not be adequate for Fort Eustis to function in its transportation training capacity or MARAD to function in its stand-by mobilization capacity. The no action alternative is evaluated in detail in this EA.

ENVIRONMENTAL CONSEQUENCES

Implementation of the proposed action would result in short-term minor adverse effects on the environmental resource areas examined in the EA. Table ES-1 summarizes the level of environmental effects on each resource area that would likely result from implementing the proposed action. The effects on the natural environment (air, noise, water resources, and biological resources) are expected to be minor and adverse. Cumulative environmental effects associated with past, present, and reasonably foreseeable future actions are also summarized.

Long-term minor adverse impacts would result from the no action alternative due to increased air emissions from mobile sources. This would result from vehicles transporting cargo between Fort Eustis and the nearest port capable of handling the 7th Group's larger vessels.

CONCLUSIONS

Based on this EA, implementation of the proposed action will have no significant direct, indirect, or cumulative effects on the quality of the natural or human environment. Because no significant environmental impacts would result from implementing of the proposed action, preparation of an Environmental Impact Statement is not required. Implementation of the mitigation measures described in Table ES-2 is recommended. Preparation of a FNSI is appropriate.

Table ES-1
Summary of Effects for the Proposed Action

Resource Area	Direct Effects	Indirect Effects	Cumulative Effects
Air Quality	Short-term minor adverse	No effects	No effects
Noise	Short-term minor adverse	No effects	No effects
Water Resources	Short-term minor adverse	No effects	No effects
Biological Resources	Short-term minor adverse to essential fish habitat and aquatic resources	No effects	Short-term minor adverse

Table ES-2
Summary of Mitigation Measures

Mitigation Measure	**Implementing Organization**
Air Quality	
• Water or chemicals would be used to control dust during dike renovations.	USACE, Norfolk District
Noise	
• Dike renovation activities would be limited to daylight hours.	USACE, Norfolk District
Water Resources	
• During dike renovation and dredging, project personnel would ensure that the project site work areas would be securely covered with tarps whenever the possibility of rain is forecast to ensure that no spilled POL, other potentially polluting substances used during the project, or debris from the project would be washed into surface waters or directed to groundwaters.	USACE, Norfolk District
• To prevent runoff and sediment loading to surface waters during dike renovations, erosion control would include silt fences, straw bale dikes, diversion ditches, riprap channels, water bars, and water spreaders.	USACE, Norfolk District
• If water quality standards were not met at the placement site discharge point, dredging would be suspended until conditions were corrected.	USACE, Norfolk District
• Standard operating procedures for the prevention of spills and contingency operations in the event of a spill are in place and would be employed. Established BMPs on fuel handling would be used to reduce or eliminate the likelihood of a spill. Spill response capabilities would be available at the dredging sites to address any accidental spills or discharges, and could be deployed to any sites along the channels to be dredged. Spill response capabilities would also be available at MARAD or other facilities in the Hampton Roads area. Installation spill response assets also exist and all spills/discharges will be reported immediately to the Fort Eustis Fire and Emergency Services Division.	USACE, Norfolk District
Biological Resources	
• Any wetlands disturbed by the hydraulic dredge line would be repaired.	USACE, Norfolk District
• Any additional protective measures will be identified by agency response to this NEPA document and by the Commonwealth of Virginia through their Virginia Water Protection Permit.	State of Virginia

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SECTION 1.0
PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 BACKGROUND

The 7th Transportation Group (Composite), an assigned tenant element of the U.S. Army Transportation Center Fort Eustis (USATCFE), maintains a harbor complex at the Third Port at Fort Eustis, Virginia, on the James River at the mouth of Skiffes Creek. The Third Port is a deep-water port used to train personnel in cargo logistics and vessel operations. The facility provides a safe harbor for the 7th Group's watercraft fleet and serves as a deployment platform for Army units. In addition, it is a joint service training facility for watercraft operators and cargo handlers. There are 62 vessels assigned to the Third Port.[1] Commercial vessels that access two industrial complexes located upstream also use Skiffes Creek.

The U.S. Maritime Administration (MARAD) maintains a small support facility at Fort Eustis in order to maintain the James River Reserve Fleet in a stand-by status. The James River Reserve Fleet is moored in the James River approximately 2 miles from the Fort Eustis shoreline. The MARAD Facility Access Channel is used solely by MARAD.

MARAD is a cooperating agency in the preparation of this document and is participating in the funding of this project.

1.2 PURPOSE AND NEED

The Army and MARAD propose to conduct maintenance dredging for two unconnected but neighboring navigation channels accessing facilities on the eastern shoreline of the James River. The Army also proposes to expand the capacity of the Fort Eustis Dredged Material Management Area (FEDMMA) to accommodate disposal of the dredged material. The purpose of the proposed action is to provide adequate access for vessels using the Third Port and servicing the James River Reserve Fleet, and to accommodate the volume of dredged material to be disposed of during this and foreseeable future dredging operations. Implementation of the proposed action would support the Army's need to maintain its capability to conduct Army and joint Logistics Over The Shore (LOTS) operations. This capability can be achieved only by developing and maintaining soldiers' proficiency in the port activities of loading and unloading military

[1] Among vessels assigned to the Third Port are 11 tug boats (ranging in size from 86 feet to 128 feet in length), 3 Logistics Support Vessels (274 feet), 16 Landing Utility Craft 2000 (174 feet), Landing Utility Craft 1600 (135 feet),

equipment and supplies from oceangoing ships. Implementation of this action would also support the MARAD's mission to maintain the James River Reserve Fleet in a 30-day stand-by status for use in the event of a national mobilization for war.

Current soundings in Skiffes Creek indicate the channel leading to the Third Port and its main pier has silted-in in some locations. Vessels are subject to running aground, hampering navigation. Vessels utilized by the 7th Group use seawater to cool the engines and transfer power from bow thrusters. With the current shallow depths, these vessels are drawing silt and muck into these systems resulting in increased maintenance, repairs and downtime for the larger vessels. Because of the shoaling the existing channel width will not allow large vessels to enter and exit the channel simultaneously, thus increasing the time associated with contingency deployments.

The MARAD Facility Access Channel has not been dredged since 1968, and the channel and turning basins have become critically shoaled. Frequent use by the MARAD's tug fleet has caused the channel to stabilize somewhat, but controlling depths are less than –8 feet mean lower low water (MLLW) in many areas. In order to meet the present and future needs of MARAD's tug fleet, it is necessary to dredge the channel to a depth of –12 feet MLLW, plus 2 feet for advance maintenance and over depth, for a total dredging depth of –14 feet MLLW. MARAD has no other property on Fort Eustis on which to dispose of the material dredged from the MARAD Facility Access Channel.

In order for the FEDMMA (the Army's preferred dredged material disposal site) to accommodate materials dredged from Skiffes Creek and the MARAD Channel, it will be necessary to expand the capacity of the FEDMMA. Currently, the older section of FEDMMA has no additional capacity, and the newer section has capacity for only 120,000 cubic yards of additional dredged material. Since the majority of the surrounding land is wetland, the FEDMMA dikes would need to be raised to avoid increasing the approximately 80-acre footprint of the site.

1.3 SCOPE

The EA identifies, documents, and evaluates the potential environmental effects of implementing the proposed action and alternatives at Skiffes Creek, the MARAD Facility Access Channel, and the FEDMMA.

Landing Craft Mechanized (73 feet), 100-ton Barge Cranes (140 feet), a Floating Machine Shop (250 feet), and various other craft.

An interdisciplinary team has reviewed the proposed action in light of existing conditions and identified relevant beneficial and adverse effects associated with the action. The EA focuses on effects that could occur within the project area, which generally consists of the channel sites, the FEDMMA, and their immediate environs. The document analyzes direct effects (those caused by the proposed action and occurring at the same time and place) and indirect effects (those caused by the proposed action and occurring later in time or farther removed in distance but still reasonably foreseeable). The potential for cumulative effects is also addressed, and mitigation measures are identified where appropriate.

1.4 PUBLIC INVOLVEMENT

Public comment on the Army's proposed action was solicited through a scoping letter distributed to Federal, state, and local agencies and citizens groups. Appendix A contains a copy of the scoping letter, the distribution list, and the responses received.

Army Regulation 200-2, *Environmental Effects of Army Actions*, provides guidance for public participation in the NEPA process. If the EA concludes that the proposed action would not result in significant environmental effects, Fort Eustis will issue a draft Finding of No Significant Impact (FNSI). Fort Eustis will then observe a 30-day period during which agencies and the public may submit comments on the proposed action, the EA, or the draft FNSI. Upon consideration of any comments received from the public or agencies, Fort Eustis may approve the FNSI and implement the proposed the action. Should the Army determine that a FNSI is not appropriate because the proposed action would result in significant impact, the Army may modify the proposed action, issue a Notice of Intent to prepare an Environmental Impact Statement, or take no action.

1.5 FRAMEWORK FOR DECISION MAKING

Several relevant statutes, implementing regulations, and Executive Orders establish standards and provide guidance on environmental and natural resources management and planning. These include, but are not limited to, the Clean Air Act (CAA); Clean Water Act; Noise Control Act; Endangered Species Act; National Historic Preservation Act; Archaeological Resources Act; Comprehensive Environmental Response, Compensation, and Liability Act; Resource Conservation and Recovery Act; Toxic Substances Control Act; Executive Order 11988 (*Floodplain Management*); Executive Order 11990 (*Protection of Wetlands*); Executive Order 12088 (*Federal Compliance with Pollution Control Standards*); Executive Order 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income*

Populations); Executive Order 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*); and Executive Order 13175 (*Consultation and Coordination with Indian Tribal Governments*). Where useful to better understanding, key provisions of some of these statutes and Executive Orders are described in more detail in the text of the EA.

SECTION 2.0
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

2.1.1 Introduction

The Proposed Action is to dredge each of the two channels to a prescribed depth, width, and length and place the dredged material in the FEDMMA.

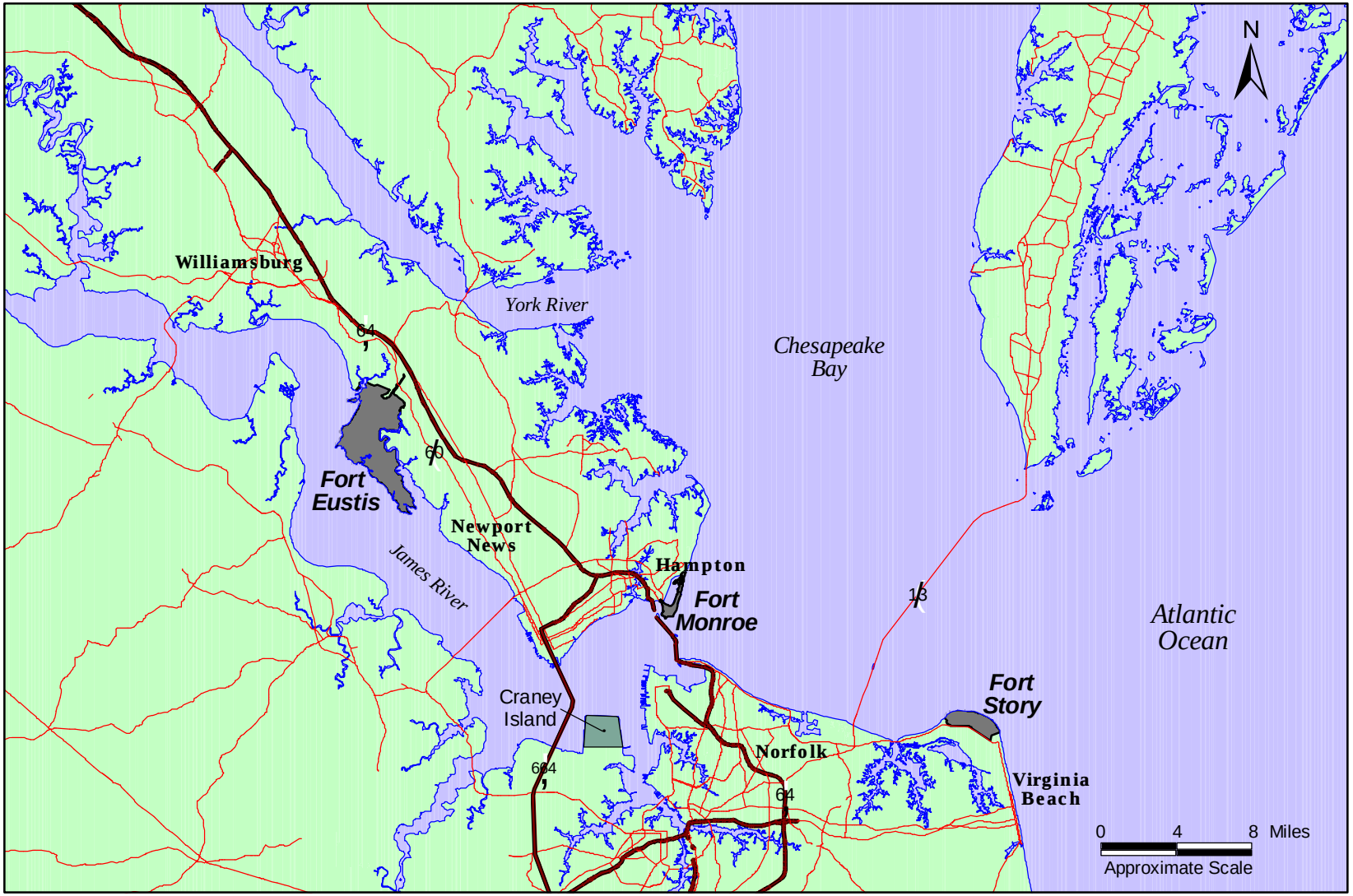
2.1.2 Project Sites

The Virginia Peninsula, extending into the Chesapeake Bay, is formed by the York River to the north and the James River to the south. Fort Eustis is on the south side of the peninsula. The cities of Newport News, Hampton, Poquoson, and Williamsburg are near the installation. Figure 2-1 shows the regional location of Fort Eustis.

The USATCFE occupies 8,228 acres fronting on the James River. The installation is flanked by two bodies of water flowing into the James River—Skiffes Creek to the northwest and Warwick River to the southeast. The Third Port is located in the northwest corner of Fort Eustis.

The MARAD maintains a small support facility on the western portion of Fort Eustis to service the James River Reserve Fleet that is moored in the James River, approximately 2 miles off the shoreline of Fort Eustis.

The FEDMMA is located on the western portion of Fort Eustis, south of the Third Port and north of the MARAD facility. Figure 2-2 shows the location of the FEDMMA and other project sites at Fort Eustis.



LEGEND

Installation

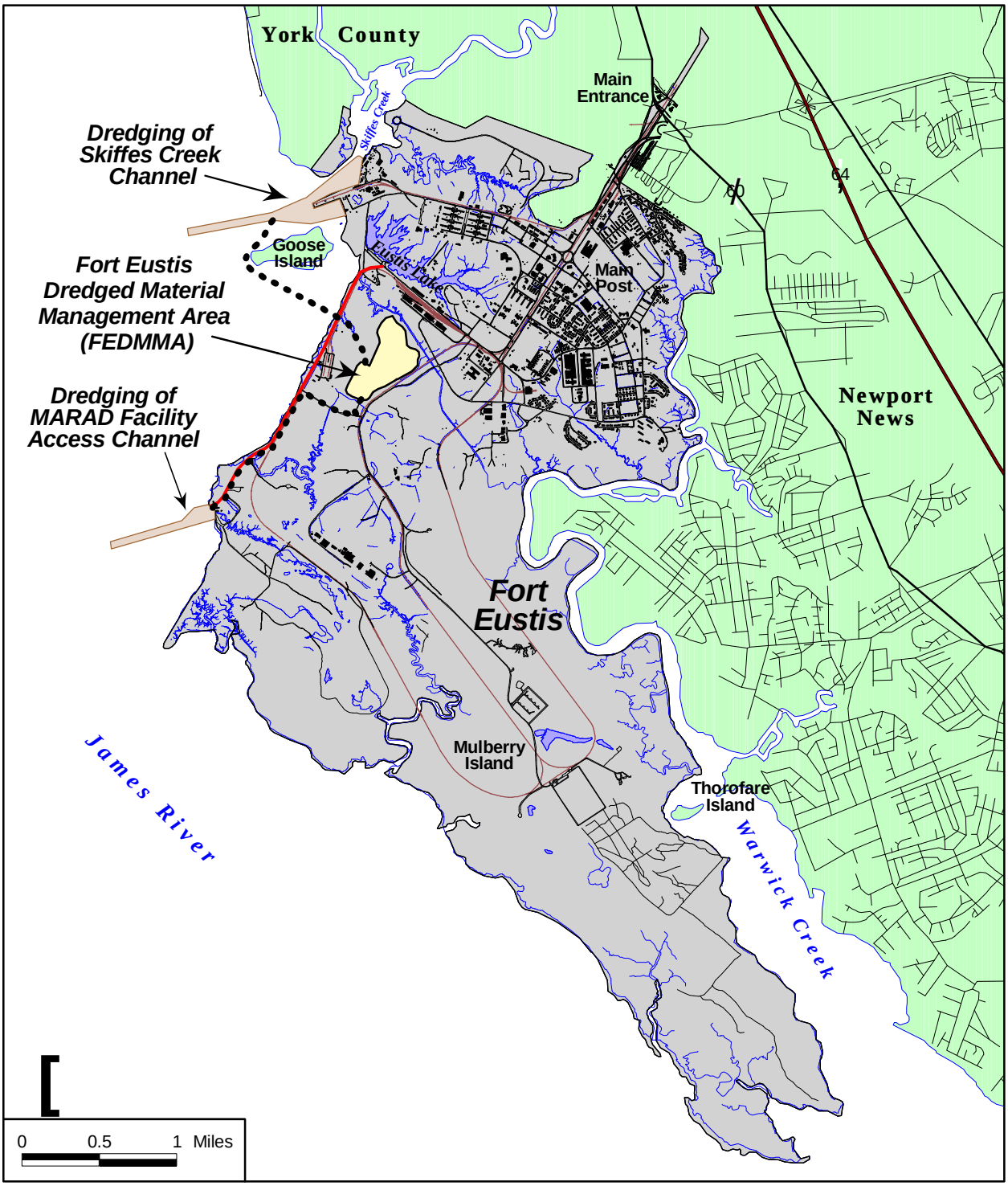
Roads

Highway

Primary Road

Location Map

Figure 2-1



LEGEND

- Building
- Installation Property
- Road
- Railroad
- Stream/Shoreline
- Dredged Area
- Harrison Road
- Approx. Dredge Pipeline Route

Source: USATCFE-CB, 1998.

Installation Map

Figure 2-2

2.1.3 Dredging Activities

Skiffes Creek Channel. The Skiffes Creek Channel would be dredged to an average depth of –16 feet MLLW (-11 feet MLLW to –17 feet MLLW) for a length of 8,300 feet from deep water in the James River into Skiffes Creek. This would include two turning basins, variable in width and 1,600 and 1,440 feet in length, with a depth of –15 MLLW. The estimated amount of dredged material is 500,000 cubic yards. The dredged material would be hydraulically pumped through a 16" pipeline, varying in length between 4,000 feet and 6,000 feet, depending on the distance to the FEDMMA. The pipeline would run (supported by floatation devices) over water to the shoreline, then cross Harrison Road and the adjacent wetlands and into the FEDMMA. A temporary ramp would be built over the pipeline allowing vehicles continued use of Harrison Road (Figure 2-2).

MARAD Facility Access Channel. The MARAD Facility Access Channel would be dredged to a depth of –14 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length with a variable width, no greater than approximately 420 feet. The estimated amount of dredged material is 180,000 cubic yards. The dredged material would be hydraulically pumped through a 16" pipeline, approximately 20,000 feet long. The pipeline would run (supported by floatation devices) over water to the shoreline, then cross Harrison Road and the adjacent wetlands and into the FEDMMA. A temporary ramp would be built over the pipeline allowing vehicles continued use of Harrison Road (Figure 2-2).

2.1.4 FEDMMA Expansion

Prior to the dredging of either Skiffes Creek Channel or the MARAD Facility Access Channel, the FEDMMA would be vertically expanded by raising the dike walls, currently 20 feet m.s.l. in the older section and 25 feet m.s.l. in the newer section, to a minimum height of 30 feet m.s.l. This would be accomplished by using the dried dredged material inside the FEDMMA from previous dredging as the source material for the raised dike walls. The outside footprint of the FEDMMA would remain unchanged. The expanded capacity would be 1.3 million cubic yards, enough to accommodate the dredged material from these two channels and an additional 27,000 cubic yards to be dredged as part of the Third Port Main Pier Replacement Project (Tetra Tech, 2002).

Dredged material placed in the FEDMMA, would be allowed to settle and excess water decanted over an outlet box that drains into Milstead Island Creek.

The 80-acre FEDMMA site is immediately adjacent to a small holding area containing a heating oil/sludge mixture, residue from a 1979 spill of 5,000 gallons of heating oil. The holding area is a National Priority List (NPL) site and is managed in accordance with the provisions of the Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA). One side of that berm would be raised as part of the FEDMMA expansion without disturbance of the sludge mixture holding area. The selected remedial action, as specified in the October 2002 Record of Decision for Site 11C – Oil/Sludge Holding Pond, includes the excavation and off site disposal of approximately 50 cubic yards of buried sludge and contaminated soil from the site. The Remedial Action is scheduled to be completed during FY03.

2.1.5 Dredged Materials Assessments

In 1975 the Commonwealth of Virginia revealed that lower portions of the James River had become contaminated with Kepone.[1] Based on subsequent testing (Environmental Testing Services, 1987) Kepone levels in both Skiffes Creek and the FEDMMA were found to be less than 0.015 µg/g. This is well below the Food and Drug Administration (FDA) action level of 0.3 µg/g. Undisturbed sediments in Skiffes Creek were sampled by IMS Environmental Services of Chesapeake, Virginia in April 2002 and detected no Kepone. Based on prior sediment testing (Environmental Testing Services, 1987 and IMS Environmental Services, 2002) there is no reason to believe sediments that would be dredged in Skiffes Creek contain contaminants at levels that would require special handling or disposal.

Because the MARAD Facility Access Channel has not been dredged since 1968, as a safeguard, the U.S. Army Corps of Engineers, Norfolk District sampled the sediment that would be dredged from this channel on November 19, 2002. The analytical results of this sampling, which detected no Kepone, are included in this EA.

2.1.6 Project Schedule

Dredging and dike renovation activities would take approximately 1 year.

[1] Kepone is the trade name of chlordecone, a chlorinated hydrocarbon insecticide. First introduced in 1958, Kepone was used until 1978. In 1975 the Virginia State Health Department ordered termination of production by the sole manufacturer when several workers developed serious neurological disorders. Kepone is no longer used or produced in the United States.

2.2 ALTERNATIVES

2.2.1 Introduction

The Army has considered three alternatives.

- No Action. No Action would involve the continuation of existing conditions of the affected environment, without implementation of the proposed action or other alternative, (i.e., no dredging of either channel and no disposal of dredged material). The no action alternative is described in Section 2.2.2 below.

- Proposed Action. The Army and MARAD preferred alternative is the proposed action as described in section 2.1 above.

- Alternative Disposal Sites. Under this alternative the two channels would be dredged with material disposed of in one or more of three alternate locations: Craney Island, the James River (overboard disposal), or at another site on Fort Eustis. The reasonableness and feasibility of using these alternative locations are discussed in section 2.2.3 below.

2.2.2 No Action Alternative

The Council on Environmental Quality (CEQ) regulations prescribe consideration of a no action alternative. This alternative also serves as a baseline against which the impacts of the proposed action and other alternatives considered can be evaluated. Under the no action alternative, the Army would not dredge the two channels and expansion of the FEDMMA would not take place. Discontinued maintenance of the two channels would result in the continued reduction in their operational depth. Eventually the channels would reach hydrodynamic equilibrium as determined by the tidal and fluvial currents of Skiffes Creek and the James River. This depth would approximate the adjacent bathymetry of the James River and would not be adequate for accomplishment of the Fort Eustis mission or for MARAD to fulfill its stand-by mobilization function. The no action alternative is evaluated in detail in Section 4.0 of this EA.

2.2.3 Alternative Disposal Sites

Craney Island

Under this alternative, the Army would dispose of the dredged material in the Craney Island Disposal Facility located in the southern portion of the Chesapeake Bay. This facility is used for the disposal of dredged material from dredging operations in the lower Chesapeake Bay, and is approximately 20 miles from the project site (Figure 2-1). In order to use this facility, the dredged

material would be placed in a barge, towed to Craney Island, and pumped from the barge into the disposal facility. This would increase dredging and material disposal costs by as much as 100 percent. More importantly, these channels are considered outside the Hampton Roads area and thus the dredged material is not eligible to be placed in Craney Island, per the Craney Island authorization documents. Because of these reasons, use of the Craney Island Disposal Facility is not considered feasible and is not examined further in this EA.

Overboard Disposal

Under this alternative, the Army would dump the dredged material into currently designated overboard areas of the James River. The impacts associated with overboard disposal would be similar to those resulting from dredging operations, except that the affected area would be larger since confinement is not technically feasible. The most obvious and most significant impact from overboard disposal would be direct burial and suffocation of benthic organisms. Numerous studies have shown that benthic organisms recover in 1-2 years after placement of dredged material. Overboard placement of dredged material in the James River occurs approximately every 5 years for material dredged from the nearby Tribell Shoal on the James River Federal Navigation Project. This designated overboard site does not have the capacity for the placement of any additional material from other project channels. Therefore, overboard disposal is not considered technically feasible and is not further evaluated in this EA.

Other Sites on Fort Eustis

Under this alternative, the Army would dispose of the dredged material at another upland location on Fort Eustis. An Environmental Assessment entitled “Maintenance Dredging, Skiffes Creek, Fort Eustis, Virginia”, prepared by the Norfolk District Corps of Engineers in August 1988, assessed the feasibility of disposing of the dredged material on the installation at the golf course, the horseback riding facility, and at training sites south of Back River Road. These alternative locations and others at Fort Eustis, previously studied by the U.S. Army Waterways Experiment Station (Miscellaneous Paper GL-87-2, July 1987) were again determined to be neither fiscally nor technically feasible nor compatible with the Fort Eustis mission or Master Plan, and therefore are not evaluated further in this EA. Both of the aforementioned documents are incorporated by reference into this EA.

SECTION 3.0: AFFECTED ENVIRONMENT

3.1 INTRODUCTION

3.1.1 Overview

Consistent with guidance issued by the Council on Environmental Quality,[1] this is a "focused" EA. The Army has considered certain environmental resources and conditions and found that they would not be affected by the proposed action. These are identified below, and the reasons for their not being examined in detail are presented. The following sections address resources and conditions that are germane to the proposed action: air quality, noise, water resources, and biological resources. These environmental resources and conditions are fully evaluated for their potential environmental effects.

3.1.2 Resources Not Examined In Detail

The Army has considered the following environmental resources and conditions and, for the reasons provided, found them not germane to the proposed action.

Land Use. Maintenance dredging for the two channels and the associated raising of the dikes of the FEDMMA would not affect land use, as the channels and the FEDMMA would continue to operate as at present and adjacent uses would not change.

***Geology and Soils*.** Dredging the two channels, raising the dikes of the FEDMMA, and placing of the dredge material in the FEDMMA would not alter the underlying geology or the soils of Fort Eustis.

Airspace. Management and control of airspace above the Skiffes Creek Channel, the MARAD Facility Access Channel, and the FEDMMA do not affect activities at these locations.

Transportation resources. While the two channels proposed to be dredged are elements of transportation resources, their dredging would not alter Fort Eustis, except for water routes, and

would only maintain existing transportation networks or systems. The continued use of the FEDMMA would not alter Fort Eustis or other transportation networks or systems.

Utilities. Maintenance dredging of the two channels and raising of the dikes of the FEDMMA would not affect utilities (e.g., potable water supply, sewer, energy sources, communications), as the existing channels and the FEDMMA do not pose demands on utilities.

Cultural resources. Consultation with the State Historic Preservation Office (SHPO) was initiated. A copy of the consultation letter sent to the SHPO is in Appendix C. Since the proposed action is maintenance dredging of channels previously dredged, the proposed action would not affect any known architectural or archeological resources listed in or eligible for the NRHP or Virginia Landmarks Register. If any issues are raised, they will be addressed as prescribed by Section 106 of the National Historic Preservation Act.

Socioeconomics. Maintenance dredging of the two channels and raising of the dikes of the FEDMMA would not affect population and would provide only a one-time boost to the economy of primarily the Hampton Roads area. As the counties in the vicinity of Fort Eustis have robust economies, the magnitude of effects would be of no measurable significance.

Environmental Justice. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies' actions substantially affecting human health or the environment not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. Maintenance dredging of the two channels and raising of the dikes of the existing FEDMMA are not actions that would exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin.

Protection of Children. Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 21, 1997), recognizes that children might suffer disproportionately from environmental health risks and safety risks. Operational areas of the Skiffes Creek Channel, the MARAD Facility Access Channel, and the FEDMMA are within a secure, limited access area and, as such, children would not be exposed to environmental health or safety risks as a result of the proposed action.

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[1] 40 CFR 1501.7(a)(3)

Solid Waste. Dredged materials would be placed within the FEDMMA and would not affect existing solid waste disposal at the site. Expansion of the FEDMMA would not generate solid waste. Construction to raise the dikes of the FEDMMA would use fill from within itself for the vertical expansion.

Hazardous and Toxic Materials. There are three potential sources of HM/HW with respect to the dredging project: toxic substances in the sediment to be dredged, hazardous materials and wastes from equipment and related operations during dredging and raising of the dikes, and HW leachate from the dredge material disposal site. Findings indicate, however, that HM/HW are not a concern with respect to this proposed action.

While dredging will resuspend sediment, contaminated sediment is not expected to be a concern for this project for reasons discussed in Section 2.1.5. HW leachate from existing disposal material at the dredge material disposal site has been sampled and was found not to be contaminated (Muller, 1998). Because the sediment from the Skiffes Creek Channel is not contaminated (as discussed in Section 2.1.5), new dredge material would not pose a HW problem. Because the MARAD Facility Access Channel has not been dredged since 1968, as a safeguard, the U.S. Army Corps of Engineers, Norfolk District tested sediments from this channel prior to the start of the dredging project and no Kepone was detected.

The Fort Eustis and Fort Story HWM SOP specifies the requirements for waste identification, storage, handling, transportation, disposal, emergency response, and waste minimization. The HWM SOP would be strictly adhered to during dredging and disposal of the dredge material. Based on these procedures, hazardous materials and wastes from equipment and other operations would not be a concern for this project.

3.2 AIR QUALITY

Fort Eustis lies in the Hampton Roads air pollution control region, which is currently considered a maintenance area for ozone (Major, 2002). This designation requires that annual air emissions for ozone precursors (nitrogen oxides [NO_x] and volatile organic compounds [VOC]) within the entire region fall below *de minimis* levels. De minimis levels are 100 ton/year NO_x and 100 ton/year VOC.

3.3 NOISE

For purposes of this document, noise is described in the context of sound levels that result directly from Fort Eustis construction and military operations and the compatibility of these levels with surrounding land uses. People residing in two single-family housing units located within 800 feet of Skiffes Creek Channel would be potential noise receptors during the proposed action. People working at the Third Port Facility, the MARAD Facility, and the golf course (located approximately 500 feet from the FEDMMA) would also be potential noise receptors.

3.4 WATER RESOURCES

3.4.1 Surface Waters

The surface waters in the vicinity of the project site are the marsh tributaries adjacent to the FEDMMA, Skiffes Creek, Bailey Creek, the James River (see Figure 2-2), and they are the only surface waters considered for the purposes of this document.

The James River is tidal along its boundary with Fort Eustis. Skiffes Creek flows for about 10 miles from its confluence with the James River at the Third Port at Fort Eustis. The lower portion of the creek is wide enough and deep enough (with periodic dredging) for the passage of commercial vessels and barges.

A consistency determination, in accordance with the Virginia Coastal Resources Management Program (VCRMP), has been prepared for the proposed action (Appendix D). Based on a review of Virginia's rules of coastal zone management, it has been determined that the proposed action is consistent with the long-term goals and policies of the VCRMP.

3.4.2 Storm Water Runoff

Storm water runoff on Fort Eustis is controlled and directed by storm sewers and drainage ditches. The storm water collection system discharges directly to the James and Warwick Rivers or to nearby creeks, lakes, and canals that discharge to the rivers (Malcolm Pirnie, 1998, cited in Tetra Tech, Inc., 1999).

3.4.3 Floodplains

Areas along the James River are prone to flooding. Water levels can rise significantly when a major storm event, such as a hurricane, backs up water in the James River at the same time that large amounts of rainfall occur. The flood of record at the installation is 15 feet, which occurred in 1958 (USACE, 1986, cited in Tetra Tech, Inc., 1999). Much of Mulberry Island lies below the 100-year flood level and is especially prone to minor tidal flooding (SAIC, 1996, cited in Tetra Tech, Inc., 1999). The mean tidal range in the area is 2.6 feet.

3.4.4 Ground Water

The Columbia Aquifer is the uppermost aquifer in the Fort Eustis area. The Columbia Aquifer is unconfined throughout most of its extent (Malcolm Pirnie, 1998, cited in Tetra Tech, Inc., 1999), and attains a maximum thickness of 35 feet, though it is generally 10 to 15 feet thick in the Fort Eustis Area (Meng and Harsh, 1988, cited in Montgomery Watson, 1997). Because the aquifer is unconfined, groundwater moves under the influence of gravity to discharge areas such as streams, rivers, and lakes. Groundwater flow is generally in a southeasterly direction. Recharge occurs primarily as infiltration of precipitation.

3.4.5 Water Quality

An assessment of contaminant levels in the surface waters of Fort Eustis was conducted in conjunction with an evaluation of the public health effects of contaminants at NPL sites. The conclusion of the assessment was that contaminant levels in surface waters at Fort Eustis were not sufficiently high to present a public health hazard.

Although Skiffes Creek and the James River are not part of Fort Eustis proper, water quality in these surface waters is of concern with respect to the proposed project because of the possibility of introducing contaminants–primarily suspended sediment–to one or both of these water bodies during dredging that would occur as part of the project. The most recent relevant water quality monitoring data for the James River (from the 1970s) and Skiffes Creek (from August 2001) indicated that water quality at both locations met Virginia standards for dissolved oxygen, total suspended solids, pH, and other criteria (VADEQ, 2001). Furthermore, studies conducted in the James River and Skiffes Creek indicate that these waterways have aquatic communities that are typical of similar habitats, other than an apparent shortage of large game fish (SAIC, 1996, cited

in Tetra Tech, Inc., 1999). This would indicate good water quality or, at worst, levels of contaminants that are not biologically significant.

3.5 BIOLOGICAL RESOURCES

3.5.1 Introduction

The U.S. Fish and Wildlife Service (USFWS); the Virginia Department of Game and Inland Fisheries; the National Marine Fisheries Service; the Virginia Marine Resources Commission; and the Department of Conservation and Recreation, were consulted regarding sensitive species and habitat issues at Fort Eustis. Copies of the letters sent and any responses received are in Appendix C.

3.5.2 Terrestrial Vegetation

Because of the artificial and altered nature of the FEDMMA and the area's specific purpose, impacts to any terrestrial vegetation that might incidentally be growing there and that would result from the placement of additional dredge material would not be considered ecologically significant.

3.5.3 Wetlands

More than 2,100 acres of tidal and nontidal wetlands are present on Fort Eustis, most of which are associated with the extensive estuarine ecosystem that surrounds much of the installation (Tetra Tech, Inc., 1999). Tidal estuarine emergent wetlands are found within 1 mile of the project site along the James River, Skiffes Creek, and Bailey Creek and surrounding Goose Island. Some palustrine-forested wetlands occur in the upper reaches of Skiffes Creek and Bailey Creek (Terwilliger Consulting, 1998).

Estuarine tidal marsh vegetation is predominantly black needlerush (*Juncus roemerianus)*, saltmarsh cordgrass (*Spartina alterniflora)*, big cordgrass (*Spartina cynosuroides*), saltmeadow cordgrass (*Spartina patens*), and cattails (*Typha sp).* Bald cypress trees (*Taxodium distichum*) and black gum (*Nyssa sylvatica*) are typically found in forested wetlands.

3.5.4 Wildlife

Several common wildlife species have been reported from habitats around Lake Eustis, including great blue heron (*Ardea herodias*), osprey (*Pandion haliaetus*), raccoon (*Procyon lotor*), mallard (*Anas platyrhynchos*), and gray squirrel (*Sciurus carolinensis*) (Malcolm Pirnie, 1998, cited in Tetra Tech, Inc., 1999). These species are somewhat tolerant of human disturbance and are likely to be found elsewhere in the vicinity of the project site. Fort Eustis is also home to a successful breeding pair of bald eagles and other rare bird species. A list of bird species known from Fort Eustis is found in Appendix E. A fish survey was conducted on the installation in 1990 (Fort Eustis, 1990). Complete results of the fish survey are found in Appendix F.

The James River is an important breeding ground for economically important shellfish. American oysters (*Crassostrea virginica*) are found in the James River and its tributaries near Fort Eustis. Public and leased oyster grounds are present off Mulberry Island from Deep Water Shoals to the mouth of the James River, and covering about 15,700 acres. The beds are primarily to the southwest of Mulberry Island. Blue crabs (*Callinectes sapidus*) are found in tidal habitats and areas containing submerged aquatic vegetation in the James River and its tributaries. The James River ranks third in crab catch and revenue for Virginia. Contamination and loss of habitat, including wetlands and submerged aquatic vegetation, represent the threats to blue crabs in the James River (SAIC, 1996, cited in Tetra Tech, Inc., 1999). Striped bass (*Morone saxatilis*) have also been reported from the James River near the dredging sites.

3.5.5 Essential Fish Habitat

The James River Estuary is Essential Fish Habitat (EFH) for nine federally managed fish species: windowpane flounder (*Scopthalmus aquosus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), summer flounder (*Paralicthys dentatus*), black sea bass (*Centropristus striata*), king mackerel (*Scomberomorus cavalla*), spanish mackerel (*Scomberomorus maculatus*), cobia (*Rachycentron canadum*), red drum (*Sciaenops occelatus*). An EFH Assessment was prepared for the Environmental Assessment to conduct maintenance dredging of the two channels and to vertically expand the FEDMMA to fulfill required consultation with the National Marine Fisheries Service mandated under the Magnuson-Stevens Fishery Conservation and Management Act. The EFH Assessment from that report is included in Appendix G.

3.5.6 Rare, Threatened and Endangered Species

An inventory of endangered, threatened, and rare animal species was conducted on Fort Eustis in 1995–1996 by the Virginia Department of Conservation and Recreation, Division of Natural Heritage (DCR-DNH, 1997). A total of three rare species and five species on the DCR-DNH animal watch list were recorded. Of the rare species, the tidewater interstitial amphipod (*Stygobromus araeus*), a federal species of concern and former Category 2 candidate, was documented on the installation for the first time. The bald eagle (*Haliaeetus leucocephalus*), which is both federally and state listed as threatened, and the great egret (*Ardea alba*), considered rare in Virginia, and the state threatened peregrine falcon (*Falco peregrinus*) have been observed during biological surveys of Fort Eustis. Two bald eagle nests, one active and another inactive as of 1999, are located in the Mulberry Island area of Fort Eustis (Terwilliger, 1999). Both nests are more than 1 mile south of the Skiffes Creek project site and of the MARAD Facility access channel, and are being managed with 0.25-mile buffer zones. Peregrine falcons have been observed nesting in a ship that is part of the James River Reserve Fleet (Tetra Tech, 1999). State special concern birds northern harrier (*Circus cyaneus*) and least tern (*Sterna antillarum*) have also been documented in the vicinity of Fort Eustis during the spring breeding season.

The Atlantic sturgeon (*Acipenser oxyrhynchus*) has been observed in the James River near Skiffes Creek and the MARAD facility. Atlantic sturgeon is a federal species of concern and a species of state special concern in Virginia. In April and May Atlantic sturgeon make spawning runs from coastal waters through the Chesapeake Bay to reach freshwater tributaries. As recent as 1997, Atlantic sturgeon have been observed spawning in the James and York Rivers (Murdy, et al., 1997). Atlantic sturgeon are bottom dwellers, feeding on benthic mollusks, insects, and crustaceans. Juvenile Atlantic sturgeon can spend several years in brackish water before moving into coastal habitats.

The Virginia Division of Natural Heritage (VDNH) completed a rare plant inventory of Fort Eustis in 1994. Seven wetland plant species on the VDNH Watch List (those that have between 20 and 100 occurrences known) were identified on Fort Eustis (Tetra Tech, Inc., 1999). Of the seven plant species on the VDNH Watch List, only shadow witch, an orchid known from the Atlantic Coastal Plain, has the potential to occur within 1 mile of the Skiffes Creek Channel in wetlands adjacent Bailey Creek.

SECTION 4.0:
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This section describes the environmental consequences of implementing the proposed dredging of Skiffes Creek and the MARAD Channel and the associated vertical expansion of the FEDMMA and the no action alternative. Cumulative effects resulting from the proposed action are discussed in Section 4.6. Recommended mitigation measures are discussed in Section 4.7.

4.2 AIR QUALITY

4.2.1 Proposed Action

Short-term direct minor adverse effects would be expected. Dike renovation and dredging activity, including the use of trucks and other heavy equipment, would emit minor amounts of NO_x, PM-10, CO, sulfur oxides, and VOC, but not at levels that would cause the area to exceed *de minimis* levels. Refer to the Record of Non-applicability (RONA) and the air quality model results in Appendix H. No indirect effects would be expected.

4.2.2 No Action

Long-term minor adverse effects would be expected. If Skiffes Creek is not able to accommodate the larger cargo ships, the cargo must be unloaded at the next available pier, which is located approximately 10 miles away. Shipping the cargo on land by way of trucks would increase mobile source emissions.

4.3 NOISE

4.3.1 Proposed Action

Short-term direct minor adverse effects would be anticipated during construction. The period of construction includes all necessary dredging and construction needed for the raising of the dikes. The use of heavy machinery would be required for this project, and increased levels of steady

noise and vibration from construction machinery would be expected. Table 4-1 illustrates typical construction equipment noise levels. Receptors closest to the noise source, as discussed in Section 3.3, would experience short-term increases in ambient noise levels. Even at the point in dredging operations where the machinery is at the closest proximity to receptors, noise levels are not expected to be a nuisance. In the short term, sensitive wildlife adjacent to dredging operations may relocate to similar nearby habitat until the project is completed.

4.3.2 No Action

No effects would be expected.

Table 4-1
Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA)[1] 50 feet from source
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Crane (Derrick)	88
Crane (Mobile)	83
Dozer	85
Grader	85
Roller	74
Truck	88

Source: Guidance Manual for Transit Noise and Vibration Impact Assessment, no date.

[1] dB is a unit used to express sound power levels where sound power level is the total acoustic output of a sound source in watts relative to the threshold of excellent youthful human hearing. dBA is "A" weighted sound level where a sound pressure level is weighted to approximate the same loudness response in an average listener, regardless of frequency, at the low sound pressure levels. This weighting provides reasonably good assessments of speech interference and community disturbance conditions.

4.4 WATER RESOURCES

4.4.1 Proposed Action

Short-term direct minor adverse effects would be expected. The surface waters of Skiffes Creek and the James River would be expected to have increased concentrations of suspended solids during the proposed dredging operation. IMS Environmental Services conducted sediment sampling and testing on undisturbed sediment in Skiffes Creek on April 1, 2002 and the sediment in the MARAD Channel on November 19, 2002. The results revealed only arsenic to be present in concentrations above the Industrial Risk-based Concentration, but it is difficult to predict from the test results what the surface water concentrations would be during dredging (see Appendix B for MARAD Channel results). Increasing the capacity of the FEDMMA is not expected to have any effect on groundwater. No effects to storm water or floodplains would be expected to occur.

4.4.2 No Action

No effects would be expected.

4.5 BIOLOGICAL RESOURCES

4.5.1 Proposed Action

Short-term direct minor adverse effects to aquatic wildlife would be expected. Dredging approximately 680,000 cubic yards of sediment to maintain the channels would be expected to have only short-term minor adverse effects on essential fish habitat and aquatic resources. These effects would be due to temporary increases in turbidity and the displacement of benthic macroinvertebrates such as worms, crabs, and mollusks in the path of the dredge (Muller, 1988). Environmental impacts would primarily result from dredging activities. The most obvious impact from dredging would be the direct destruction or displacement of benthic macroinvertebrates, i.e., worms, crabs, and mollusks, in the path of the dredge. Past studies have shown that recolonization of a deepened channel by benthic organisms may occur within 2 weeks to 2 years, depending on the time of year the dredging is accomplished, the availability of recruitment areas, and the depth of the dredged channel. Even though the original biomass may be attained in that period, recolonization is usually by opportunistic species, which are less valuable to the food

chain. Original species diversity is seldom attained and, consequently, the number of bottom-feeding fish seldom attains pre-dredging proportion or species diversity. The substrate type in the original channel may influence species diversity in the deepened channel. Decreased oxygen supply in and above the substrate may also influence species diversity (Muller, 1988).

Although the siphoning action of cutterhead type dredge produces minimal turbidity, during dredging the bottom sediments would be disturbed and a small percentage would be placed in suspension. When excessive, turbidity can reduce the penetration of light necessary for photosynthesis by phytoplankton and macrophytes, thus reducing the oxygen supply in the water column. Suspended sediment could cause adverse impacts on filter-feeding organisms. In filter feeders, heavy suspended sediment loads could cause abrasion of gill filaments, clogging of gills, impaired respiration, impaired feeding, reduced pumping rates, retarded egg deve1opment, and reduced growth and survival of larvae. Similar impacts could occur to zooplankton, larval fish, and larval blue crabs. These impacts would not readily affect adult fish because of their mobility. However, filter-feeding fish could be affected more than non-filter-feeding fish. Dredging could also result in chemical changes in the water column such as decreased dissolved oxygen levels due to increased oxygen demand resulting from resuspension of nutrients and sediments (Muller, 1988). Turbidity and siltation could adversely affect shellfish populations in the vicinity of the channel, but only within 500 feet of the dredge. These effects are considered short-term.

No direct adverse effects on terrestrial vegetation, wetlands, or wetland wildlife including globally declining amphibian populations would be expected from using the existing FEDMMA to store dredged sediment. Excess water in the FEDMMA would be removed through a standpipe and returned directly to the James River, leaving the hydrology of surrounding wetlands unaffected. Dredging and dike renovation activities would not affect any upland habitats or upland species either. The hydraulic dredge line from Skiffes Creek Channel to the FEDMMA would be routed around the western side of Goose Island, thereby avoiding potenitial adverse effects to state-owned wetlands. The hydraulic dredge line from the MARAD Channel to the FEDMMA would be routed through disturbed areas along existing Fort Eustis roads. If the dredge line would burst during operations, the line would be immediately shut down and repaired, preventing all but negligible sedimentation effects to Fort Eustis wetlands and James River wildlife.

Negligible direct adverse effects to terrestrial wildlife and rare, threatened, or endangered species would be expected. Skiffes creek and the MARAD channel are industrial areas that have seen over 50 years of constant boat traffic, engine noise, and other human disturbance. Fish and wildlife species that remain near Fort Eustis facilities are presumed to be habituated to noise and periodic disturbance. No effects from dredging to nesting bald eagles would be expected. Both nests are more than one mile away from the MARAD Facility and Skiffes Creek and would not be expected to be disturbed by the action. Bald eagles and many other birds raise their young in the spring. Fish species also migrate and spawn in the spring. Dredging restrictions in the James River to protect anadromous fish habitat from February 15th to June 30th would preclude activities that could disturb striped bass, Atlantic sturgeon, bald eagle, great egret, northern harrier, least tern, and other fish and birds during the spring breeding season. No effects to peregrine falcons nesting on ships parked in the James River Reserve Fleet would be expected because these ships would not move or be otherwise affected by dredging operations.

4.5.2 No Action

No effects would be expected.

4.6 CUMULATIVE EFFECTS

Cumulative effects are those that result from the incremental effects of an action when considering past, present, and reasonable foreseeable actions, regardless of the agencies or parties involved. Cumulative effects can result from individually minor but collectively significant factors taking place over time as they may relate to the entire installation and the ROI. Following is a listing of cumulative effects by resource area that would be expected to occur.

Air Quality. No cumulative effects would be expected.

Noise. No cumulative effects would be expected.

Water Resources. No cumulative effects would be expected.

Biological Resources. Minor beneficial cumulative effects to aquatic resources would result from removing approximately 680,000 cubic yards of sediment.

4.7 MITIGATION MEASURES

The Army could implement the mitigation measures described here to avoid, reduce, or compensate for adverse effects that might occur as a result of implementing the proposed action. Mitigation measures would not be required for the no action alternative. The U.S. Army Corps of Engineers, Norfolk District, would have the overall responsibility for implementing mitigation measures.

Air Quality

- Water or chemicals would be used to control dust during dike renovations (Virginia State Air Pollution Control Board, 1985).

Noise

- Dike renovation activities would be limited to daylight hours only.

Water Resources

- During dike renovation and dredging, project personnel would ensure that work areas are securely covered with tarps whenever the possibility of rain is forecast to ensure that no spilled POL, other potentially polluting substances used during the project, or debris from the project are washed into surface waters or directed to groundwater.

- To prevent runoff and sediment loading to surface waters, erosion control during dike renovation activities could include silt fences, straw bale dikes, diversion ditches, riprap channels, water bars, and water spreaders.

- If water quality levels were not met at the placement site discharge point, dredging would be suspended until conditions were corrected.

- Standard operating procedures for the prevention of spills and contingency operations in the event of a spill are in place and would be employed. Established BMPs on fuel handling would be used to reduce or eliminate the likelihood of a spill. Spill response capabilities would be available at the dredging sites to address any accidental spills or discharges, and could be deployed to any sites along the channels to be dredged. Spill

response capabilities would also be available at MARAD or other facilities in the Hampton Roads area. Installation spill response assets also exist and all spills/discharges will be reported immediately to the Fort Eustis Fire and Emergency Services Division.

Biological Resources

- Any wetlands disturbed by the hydraulic dredge line would be repaired.
- Any additional protective measures will be identified by the agency response to this NEPA document and by the Commonwealth of Virginia through their Virginia Water Protection Permit.

SECTION 5.0: FINDINGS AND CONCLUSIONS

The physical environments at Fort Eustis would not be significantly affected by proceeding with the dredging and dike renovation project. Implementation of the proposed action would result in short-term minor adverse effects on the environmental resource areas examined in the EA. Table 5-1 summarizes the level of environmental effect on each resource area that would likely result from implementation of the proposed action. The effects on the natural environment (air, noise, water resources, and biological resources) are expected to be minor and adverse. No adverse or beneficial effects would result from the no action alternative.

RECOMMENDATION

Because no significant environmental impacts would be expected to result from implementation of the proposed action, preparation of an Environmental Impact Statement is not required. Implementation of the mitigation measures described in Table 5-2 is recommended. Preparation of a FNSI is appropriate.

Table 5-1
Summary of Effects for the Proposed Action

Resource Area	Direct Effects	Indirect Effects	Cumulative Effects
Air Quality	Short-term minor adverse	No effects	No effects
Noise	Short-term minor adverse	No effects	No effects
Water Resources	Short-term minor adverse	No effects	No effects
Biological Resources	Short-term minor adverse to essential fish habitat and aquatic resources	No effects	Short-term minor adverse

Table 5-2
Summary of Mitigation Measures

Mitigation Measure	Implementing Organization
Air Quality	
• Water or chemicals would be used to control dust during dike renovations.	USACE, Norfolk District
Noise	
• Dike renovation activities would be limited to daylight hours.	USACE, Norfolk District
Water Resources	
• During dike renovation and dredging, project personnel would ensure that the project site work areas would be securely covered with tarps whenever the possibility of rain is forecast to ensure that no spilled POL, other potentially polluting substances used during the project, or debris from the project would be washed into surface waters or directed to groundwaters.	USACE, Norfolk District
• To prevent runoff and sediment loading to surface waters during dike renovations, erosion control would include silt fences, straw bale dikes, diversion ditches, riprap channels, water bars, and water spreaders.	USACE, Norfolk District
• If water quality standards were not met at the placement site discharge point, dredging would be suspended until conditions were corrected.	USACE, Norfolk District
• Standard operating procedures for the prevention of spills and contingency operations in the event of a spill are in place and would be employed. Established BMPs on fuel handling would be used to reduce or eliminate the likelihood of a spill. Spill response capabilities would be available at the dredging sites to address any accidental spills or discharges, and could be deployed to any sites along the channels to be dredged. Spill response capabilities would also be available at MARAD or other facilities in the Hampton Roads area. Installation spill response assets also exist and all spills/discharges will be reported immediately to the Fort Eustis Fire and Emergency Services Division.	USACE, Norfolk District
Biological Resources	
• Any wetlands disturbed by the hydraulic dredge line would be repaired.	USACE, Norfolk District
• Any additional protective measures will be identified by the agency response to this NEPA document and by the Commonwealth of Virginia through their Virginia Water Protection Permit.	State of Virginia

SECTION 6.0: REFERENCES

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McCall, Steven, U.S. Army Transportation Center and Fort Eustis. February 19, 2002.

Wilcox, Thomas, Virginia Department of Game and Inland Fisheries. November 21, 2002.

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Appendix A

Scoping Letter, Distribution List, and Responses

24 September 2002

Programs and Management Division

SEE LIST OF ADDRESSES

Dear Sir or Madam:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment, on behalf of the Army and the U.S. Maritime Administration (MARAD), which will evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring Federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and MARAD propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed of is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed of is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 25 October 2002. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PL-R, 803 Front Street, Norfolk, VA 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment in late November 2002.

If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.

Sincerely,

Richard J. Muller

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9 October 2002

Mr. Richard Muller
U.S. Army Corps of Engineers, Norfolk District
Attn: CENAO-PL-R
803 Front Street
Norfolk, Virginia 23510-1096

Re: Proposed James River dredging operations and FEDMMA
Reply to letter of 26 September 2002

Dear Mr. Muller:

There are no obvious adverse effects to the geology or mineral resources in the areas that will be dredged or stockpiled. This Department has no further comments on the proposed project.

Sincerely,

Gerald Wilkes
Geologist Senior
DMME/DMR

EQUAL OPPORTUNITY EMPLOYER
TTY / TDD (800) 828-1120 — Virginia Relay Center

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October 11, 2002

Mr. Richard Muller
U.S. Army Corps of Engineers
Norfolk District, Attn: CENAO-PL-R
803 Front Street
Norfolk, VA 23510-1096

Re: Environmental Assessment Scoping Letter for Dredging and Expansion of FEDMMA at Fort Eustis (ENV:GEN)

Dear Mr. Muller:

Pursuant to your request of September 26, 2002, the staff of the Hampton Roads Planning District Commission has reviewed the Environmental Assessment scoping letter regarding dredging and vertical expansion of the Fort Eustis Dredged Materials Management Area (FEDMMA). We have contacted the City of Newport News concerning the proposed project.

Based on the information presented in your letter, the City of Newport News requests that the following concerns be addressed in the Environmental Assessment:

- Potential for kepone and other heavy metals to be suspended in the water column for a period of time during the dredging process;
- Containment of pollutants to the area where dredging is occurring;
- Handling of contaminated dredge spoils during transfer to dredge spoil site; and
- Replacement of critical habitat areas disturbed during dredging.

We appreciate the opportunity to comment prior to the release of the Environmental Assessment. If you have any questions, please do not hesitate to call.

Sincerely,

Arthur L. Collins
Executive Director/Secretary

ALS:fh

Copy: Ms. Kathy James-Webb, NN

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

OCT 8 2 2002

Mr. Richard Muller
U.S. Army Corps of Engineers
Norfolk District
ATTN: CENAO-PL-R
803 Front Street
Norfolk, VA 23510-1096

Re: Dredging on the Eastern Shoreline of the James River, Virginia

Dear Mr. Muller:

In accordance with the National Environmental Policy Act and Section 309 of the Clean Air Act, we are responding to your invitation to provide written comments on the above referenced project. EPA understands that the Army proposes to dredge two unconnected but neighboring Federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

More specifically, the Skiffes Creek Channel will be dredged to a depth of -16 feet MLLW for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of -15 MLLW (estimated yardage of dredged material to be disposed of is 450,000 cubic yards). The MARAD Facility Access Channel would be dredged to a depth of -12 feet MLLW for a length of 2,800 feet (the estimated yardage of dredged material to be disposed of is 170,000 cubic yards). Considering the magnitude of the project, EPA suggests that the following suggestions be incorporated into the Environmental Assessment (EA) to assess the environmental effects of the proposed action.

As you are probably aware, dredging can create a whole host of adverse environmental impacts where the magnitude of the impact is contingent upon site-specific details. Impacts can be caused by the dredging process itself or by the fill which has been dredged. A major concern is the content of the fill. Dredging by definition disturbs and breaks up the substrate mobilizing substrate particles. If the substrate contains any kind of contaminant, the contaminant can potentially pose risks to the benthic and plant communities and the organisms that consume them

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or can be transported to other areas. The amount of potential harm associated with dredging depends upon the amount and the type of constituent (e.g., lead, copper, etc.) and the communities at risk. The sediments to be dredged should be tested for contamination. If contaminants are present, further research should be conducted to understand the potential environmental effects of dredging specific to the contaminants identified.

A resource assessment within the dredging area and contiguous to it is necessary to determine effects to the biological/aquatic/biota communities. Dredging could result in the removal of benthic organisms; the destruction of habitat; possible release of oxygen-consuming substances that could lead to lowered levels of dissolved oxygen; possible release of nutrients (especially ammonia) that could increase the rate of phytoplankton production; possible release of metals and other toxic substances that could adversely affect the biota; short-term period of increased turbidity in water with fine sediments around the dredge, especially in the case of mechanical dredging, which could decrease visibility for fish.

Therefore, the EA should identify the location of any Submerged Aquatic Vegetation (SAV) beds and fisheries and shell fisheries resources found in the project area as well as identify any sensitive or high quality spawning areas. A location map identifying the above resources should be provided. In addition, the EA should describe the existing benthic environment of the project area. A complete species composition list (plants and animals) should be provided for the above-mentioned habitats. A description of the potential impacts to the migration or spawning activities of the animal species in the project area should be provided in the EA as well as proposed mitigation for the possible loss of this habitat.

A time of year restriction on dredging activities should be imposed to mitigate for environmental seasonal factors in addition to protecting aquatic and animal life. The National Marine Fishery Service and the U.S. Fish and Wildlife Service should be consulted on this issue.

Because it is proposed to vertically expand the dike walls of the FEDMMA to a minimum height of 35 feet, a sound engineering evaluation is necessary to ensure the stability of the dike. In addition, an engineering assessment on the retention times is necessary to ensure that the new structure will not have negative impacts on water quality standards.

Dredging equipment and techniques vary considerably in the United States. There must be compatibility between dredging equipment and the material excavated. We recommend that the EA contain information on the dredging equipment, the device used for excavation, and the type of pumping device to be used.

Dredging of a channel way may allow for an increase in ship traffic and usage by larger ships that draw more water. The types of shipping that may increase warrant scrutiny. The EA should provide the current and future uses of the channel served.

As a result of the dredging activity and the potential increase in traffic along the channels, an air quality assessment should be conducted to ensure compliance with National Ambient Air Quality Standards.

Since maintenance dredging is usually required, the EA should include a plan for addressing the possibility of maintenance dredging.

In closing, the above comments are not exclusive of what is required for the EA. However, they do provide a brief framework of environmental issues specific to the proposed action. Thank you for the opportunity to participate in this early evaluation effort of the scoping process. If you need additional assistance, the staff contact for this project is Karen DelGrosso; she can be reached at 215-814-2765.

Sincerely,

William Arguto
NEPA/Federal Facilities Team Leader

Appendix B

Sediment Sampling Results

MARAD CHANNEL SEDIMENT INVESTIGATION

Maritime Administration Facilities
Fort Eustis, Virginia

IMS Project Number: 351-3359

Submitted To:
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December 26, 2002

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Appendix A: Photodocumentation
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1.0 INTRODUCTION

The United States Army Corps of Engineers (USACE) contracted IMS Environmental Services (IMS) to conduct a pre dredge sediment investigation in the 3,620 foot channel that extends from the U.S. Maritime Facilities (MARAD) to the National Defense Reserve Fleet (NDRF) site on the James River, Virginia. (Figure 1).

IMS evaluated the channel sediments with the intent of determining contamination prior to dredging and land application of the dredge spoils. The proposed dredging is expected to sufficiently deepen the channel to continue the capability of service boat traffic to the NDRF. The site location is illustrated in Figure 1. Vibracore sediment borings were performed at the locations indicated on Figure 2. Photodocumentation of the events performed are included as Appendix A.

This investigation delineates the background concentrations of the following parameters: target compound list-poly aromatic hydrocarbons (TCL-PAHs), target analyte list–metals (TAL-Metals), Benzene, Ethylbenzene, Toluene Xylene (BETX), Total Petroleum Hydrocarbons Diesel and Gasoline Range Organics (TPH DRO / GRO), Kepone and moisture content in the sediment of the channel bottom at the project site.

Elutriate samples were also collected during this investigation, in order to properly assess the impact of dredge material on the water column and on land application or beach replenishment. Elutriate analysis is simulated dredging in a laboratory environment. The elutriate laboratory method provides a more accurate representation of the leaching of chemical constituents from dredge material. Due to the volatile procedure of the elutriate method BETX, and TPH-GRO can not be analyzed with this method.

This sampling investigation uses Virginia Department of Environmental Quality (VDEQ) reporting guidelines, Average Sediment Concentration for the James River Basin and Environmental Protection Agency (EPA) Risk Based Concentrations (RBCs).

3.0 INVESTIGATIVE METHODS

IMS conducted site sampling in conjunction with EEA Incorporated (EEA) of Garden City, New York on November 19, 2002 utilizing a boat mounted Rossfelder P-1 electric and gas powered mechanical vibratory corer. IMS and EEA collected 4 sediment vibracore borings (SS-1 through SS-4) as shown in Figure 2. Appendix 1 contains photodocumentation of the sampling event.

The depths of the vibratory boring along with sample recovery interval, and a description of the sediment encountered is shown in Table 1.

Table 1: Vibratory Boring Descriptions

Sample ID	Water Depth (ft)	Core Barrel Push Depth (ft)	Core Recovery Interval (ft)	Sediment Description
SS-1	8	15	6	Dark Gray – Fine Silt
SS-2	6	15	7.5	Dark Gray - Fine Silt
SS-3	9	3	2	Medium Gray - Dense Fine Sands
SS-4	8	15	6	Dark Gray - Fine Silt

Sediment sample SS-3 encountered dense sands that the vibracore barrel could not penetrate. With SS-3 being almost at the mid point of the MARAD Facility and the NRDF, IMS suspects this to be an area of scour along the river bottom, with little of no soft sediments.

Sediment samples were composited by IMS personnel in the following manner:

For Total Analytes:

Sediment from the entire sample column of vibracore barrel was composited into one sample, SS-1. This procedure was repeated for each sediment sample (SS-2, SS-3, and SS-4) boring. Samples were shipped to STL and analyzed for TPH-DRO & GRO, BETX, TAL-Metals, Kepone, TCL-PAHs, and Moisture Content.

The sediment from the entire core of all four sediment samples (SS-1, SS-2, SS-3, and SS-4) was retained for two elutriate samples, which are discussed below. Sediment from each boring was composited in clean poly lined 5 gallon buckets and placed into clean glass sample containers.

For Elutriates:

One composite elutriate sample (Elutriate-1) was collected from the entire sample column of SS-1 and SS-2. A second sample (Elutriate-2) was collected from the entire sample column of SS-3 and SS-4. Three 1-gallon wide mouth glass jars were filled for each elutriate sample.

All samples were shipped to Severn Trent Laboratories (STL) to be analyzed for Kepone, TPH-DRO, TAL-Metals, and TCL-PAHs. Five 1-gallon glass amber jars of site water were also collected to be used in the elutriate extraction procedure.

4.0 INVESTIGATIVE RESULTS

4.1 Site Water Results

Site water is analyzed to determine any impact the water column may have when evaluating the elutriate samples. Site water was analyzed for TPH-DRO & GRO, BETX,

TAL-Metals, Kepone, and TCL-PAHs. Analytical results for this site water showed non detectable levels of TPH-DRO & GRO, BTEX, Kepone, and TCL-PAHs.

The only detectable levels in the site water were TAL-Metals, specifically, Aluminum, Calcium, Iron, Magnesium, Manganese, and Sodium. All of which are expected constituents for this surface water. Complete analytical results for Site Water attached as Appendix C.

4.2 Analytes Total Results

Samples of the sediment were analyzed for TPH-DRO & GRO, TAL-Metals, Kepone, TCL-PAHs, and Moisture Content. Summaries of those sample results are presented in the following sections. Complete sample results can be found in Appendix C.

4.2.1 Petroleum Hydrocarbons

Parameters for sediment analysis of petroleum hydrocarbon constituents are summarized in Table 2.

These values should compared to the VDEQ reporting limit for TPH-DRO and GRO of 100 mg/kg, as it appears in 9 VAC 25-580.

As can be noted no sample is above that VDEQ limit. Levels are noted to decrease along the channel with the highest levels on the eastern end of the channel closest to the MARAD Bulkhead.

Table 2: Sediment Analytical Summary: Petroleum Hydrocarbons

Sample ID	Parameter	Result	RL	Units
SS-1	TPH-DRO	89	87	mg/kg
	TPH-GRO	2100	170	ug/kg
SS-2	TPH-DRO	30	23	mg/kg
	TPH-GRO	ND	230	ug/kg
SS-3	TPH-DRO	8.4 J	13	mg/kg
	TPH-GRO	ND	130	ug/kg
SS-4	TPH-DRO	6.0 J	22	mg/kg
	TPH-GRO	ND	220	ug/kg

RL – Laboratory Reporting Limit
J – Indicates an estimated concentration value below the Reporting Limit.
ND – Non Detectable Concentration

4.2.2 Kepone

The collected sediment samples were analyzed for Kepone. Kepone is a highly toxic pesticide ingredient that was discharged to the James River and persists in the sediments.

Although Kepone is prevalent in much of the James River, none of the analytical results were above detection limits for the samples collected for Kepone. Complete laboratory results for Kepone are included in Appendix C.

Table 3: Sediment Analytical Summary: Kepone

Sample ID	Parameter	Result	RL	Units
SS-1	Kepone	ND	1300	ug/kg
SS-2	Kepone	ND	1500	ug/kg
SS-3	Kepone	ND	1300	ug/kg
SS-4	Kepone	ND	1400	ug/kg

RL – Laboratory Reporting Limit
ND – Non Detectable Concentration

4.2.3 TCL-PAHs

Sediment samples were analyzed for TCL-PAH constituents. Analytical results that were reported above detection limits are summarized in Table 4. Individual analyte results that are below the reportable limit but were estimated by the laboratory are not presented in this summary.

Detectable concentrations were then compared to the EPA Region III Risk Based Concentration (RBC) table. A complete copy of the RBC table is included in Appendix B for reference. The comparison is made to RBC values for Sediment in an industrial setting. No samples exceeded the RBCs for each individual analyte. A complete list of PAH constituents and original laboratory results are included in Appendix C.

Table 4: Sediment Analytical Summary: TCL-PAH Constituents Above Detection Limits

Sample ID	Parameter	Result	RL	RBC	Units
SS-1	Acenaphtylene	8.8	6.4	**	ug/kg
	Flourene	6.4	6.4	82,000,000	ug/kg
	Phenanthrene	18	6.4	**	ug/kg
	Anthracene	14	6.4	610,000,000	ug/kg
	Fluoranthene	100	6.4	82,000,000	ug/kg
	Pyrene	52	6.4	61,000,000	ug/kg
	Benzo(a)anthracene	30	6.4	7,800	ug/kg
	Chrysene	42	6.4	780,000	ug/kg
	Benzo(b)fluoranthene	63	6.4	780	ug/kg
	Benzo(a)pyrene	35	6.4	780	ug/kg
	Indeno(1,2,3-cd)pyrene	30	6.4	7,800	ug/kg
	Dibenzo(a,h)anthracene	13	6.4	**	ug/kg
	Benzo(g,h,i)perylene	35	6.4	**	ug/kg
SS-2	Phenanthrene	8.8	7.5	**	ug/kg
	Anthracene	8.3	7.5	610,000,000	ug/kg
	Fluoranthene	35	7.5	82,000,000	ug/kg
	Pyrene	19	7.5	61,000,000	ug/kg
	Benzo(a)anthracene	14	7.5	7,800	ug/kg
	Chrysene	21	7.5	780,000	ug/kg
	Benzo(b)fluoranthene	24	7.5	780	ug/kg
	Benzo(a)pyrene	15	7.5	780	ug/kg
	Indeno(1,2,3-cd)pyrene	12	7.5	7,800	ug/kg
	Benzo(g,h,i)perylene	14	7.5	**	ug/kg
SS-4	Fluoranthene	12	7.2	82,000,000	ug/kg
	Pyrene	12	7.2	61,000,000	ug/kg
	Chrysene	7.7		780,000	ug/kg
	Benzo(a)pyrene	8.7		780	ug/kg

RL – Laboratory Reporting Limit
RBCs – Risked Based Concentrations
** - No RBC is given for this analyte

4.2.4 TAL-Metals

Sediment samples were analyzed for TAL-Metal constituents. Analytical results reported near or above the detection limits for these samples are displayed in Table 5. Individual analyte results that are below the reportable limit but were estimated by the laboratory are not presented in this summary.

Detectable concentrations were then compared to the EPA Region III RBC table. This comparison is made to RBC values for sediment in an industrial setting. A comparison of the constituents listed in Table 5 are also made to average sediments metals

concentrations in the James River Basin as identified by the VDEQ in 2001. A complete list of TAL-Metals original laboratory results is included in Appendix C.

Table 5: Sediment Analytical Summary: TAL-Metals Constituents Above Detection Limits

Sample ID	Parameter	Result	RL	RBC (Industrial)	Historical Sediment Metals Average James River Basin (VDEQ 2001)	Units
SS-1	Aluminum	4,420	19.2	2,000,000	29,601	mg/kg
	Arsenic	***3.5***	***0.96***	***3.8***	***5.92*** [2]	***mg/kg***
	Barium	29.3	19.2	140,000	**	mg/kg
	Beryllium	0.71	0.38	4,100	5.00	mg/kg
	Calcium	836	480	**	**	mg/kg
	Chromium	14.1	0.48	6,100	34.54	mg/kg
	Copper	37.3 N	2.4	82,000	29.57	mg/kg
	Iron	14,800	9.6	610,000	40,924	mg/kg
	Potassium	709	480	**	**	mg/kg
	Magnesium	1,220	480	**	**	mg/kg
	Manganese	112	1.4	41,000	1,110	mg/kg
	[1]Mercury	0.14	0.032	**	0.12	mg/kg
	Sodium	1,740	480	**	**	mg/kg
	Nickel	9.4	3.8	41,000	21.47	mg/kg
	Lead	57.2 N	0.29	**	31.03	mg/kg
	Vanadium	49.3 N	4.8	14,000	**	mg/kg
	Zinc	115 N	1.9	610,000	125.10	mg/kg
SS-2	Aluminum	14,100	22.6	2,000,000	29,601	mg/kg
	Arsenic	***7.5***	***1.1***	***3.8***	***5.92*** [2]	***mg/kg***
	Barium	66.4	22.6	140,000	**	mg/kg
	Beryllium	1.5	0.45	4,100	5.00	mg/kg
	Calcium	1330	565	**	**	mg/kg
	Cobalt	10.0	5.7	120,000	**	mg/kg
	Chromium	27.9	0.57	6,100	34.54	mg/kg
	Copper	32.5 N	2.8	82,000	29.57	mg/kg
	Iron	33,700	11.3	610,000	40,924	mg/kg
	Potassium	1,990	565	**	**	mg/kg
	Magnesium	3,320	565	**	**	mg/kg
	Manganese	484	1.7	41,000	1,110	mg/kg
	[1]Mercury	0.28	0.038	**	0.12	mg/kg
	Sodium	2,440	565	**	**	mg/kg
	Nickel	16.3	4.5	41,000	21.47	mg/kg
	Lead	40.6 N	0.34	**	31.03	mg/kg
	Thallium	2.7	1.1	5.5	5.00	mg/kg
	Vanadium	60.9 N	5.7	14,000	**	mg/kg
	Zinc	195 N	2.3	610,000	125.10	mg/kg

Table 5: Continued

Sample ID	Parameter	Result	RL	RBC (Industrial)	Historical Sediment Metals Average James River Basin (VDEQ 2001)	Units
SS-3	Aluminum	1,850	19.5	2,000,000	29,601	mg/kg
	Arsenic	***1.4***	***0.98***	***3.8***	***5.92*** [2]	***mg/kg***
	Chromium	5.0	0.49	6,100	34.54	mg/kg
	Copper	4.1 N	2.4	82,000	29.57	mg/kg
	Iron	5,120	9.8	610,000	40,924	mg/kg
	Magnesium	584	488	**	**	mg/kg
	Manganese	72.9	1.5	41,000	1,110	mg/kg
	[1]Mercury	0.041	0.032	**	0.12	mg/kg
	Lead	6.0 N	0.29	**	31.03	mg/kg
	Sodium	1040	488	**	**	mg/kg
	Vanadium	10.3 N	4.9	14,000	**	mg/kg
	Zinc	27.5 N	2	610,000	125.10	mg/kg
SS-4	Aluminum	1820	21.7	2,000,000	29,601	mg/kg
	Arsenic	***8.9***	***1.1***	***3.8***	5.92 [2]	***mg/kg***
	Barium	86.8	21.7	140,000	**	mg/kg
	Beryllium	1.7	0.43	4,100	5.00	mg/kg
	Calcium	1420	542	**	**	mg/kg
	Cadmium	0.55	0.54	1,000	1.01	mg/kg
	Cobalt	10.9	5.4	120,000	**	mg/kg
	Chromium	31.1	0.54	6,100	34.54	mg/kg
	Copper	30.3 N	2.7	82,000	29.57	mg/kg
	Iron	36,200	10.8	610,000	40,924	mg/kg
	Potassium	2,260	542	**	**	mg/kg
	Magnesium	3,580	542	**	**	mg/kg
	Manganese	785	1.6	41,000	1,110	mg/kg
	Sodium	2,700	542	**	**	mg/kg
	[1]Mercury	0.35	0.36	**	0.12	mg/kg
	Nickel	17.5	4.3	41,000	21.47	mg/kg
	Lead	40.2 N	0.33	**	31.03	mg/kg
	Thallium	2.3	1.1	5.5	5.00	mg/kg
	Vanadium	66.0 N	5.4	14,000	**	mg/kg
	Zinc	175 N		610,000	125.10	mg/kg

RL - Laboratory Reporting Limit
RBCs - Risked Based Concentrations
N - Spiked Analyte recovery is outside stated control limits
** - No level is issued for this analyte
[1] Mercury analyzed by Method SW 846 7471 (Cold Vapor)
[2]Standard deviation for the average arsenic level is 1.6

Arsenic was the only TAL-metal during this sampling investigation analyzed at levels above the RBCs levels. Arsenic was detected in sediment samples SS-2, and SS-4 above the industrial RBC level. These two samples were also above the average arsenic concentration as noted by historical sediment sampling, but not by an additional order of magnitude.

4.2.5 BTEX

Sediment samples were analyzed for BTEX constituents. All samples were reported as non-detectable concentrations for BETX constituents. The laboratory analytical results are located in Appendix C.

4.2.6 Total Residue as Percent Solids

Sediment samples were also analyzed for Total Residue as Percent Solids. The analytical results are summarized in Table 6 below. Original laboratory results for Percent Solids is included in Appendix C.

Table 6: Sediment Analytical Summary: Total Residue as Percent Solids

Sample ID	Parameter	Result	Units
SS-1	Total Residue as % Solids	57.2	%
SS-2	Total Residue as % Solids	44.2	%
SS-5	Total Residue as % Solids	77.0	%
SS-6	Total Residue as % Solids	46.1	%

4.3 Elutriate Sampling Results

Sediment Samples SS-1 and SS-2 were composited into a sample labeled as Elutriate 1, while, SS-3 and SS-4 were composited into a sample labeled Elutriate 2. These elutriate samples were analyzed for all previously stated constituents with the exception of BTEX and TPH-GRO. Due to the volatility of these parameters, accurate results would not be achieved utilizing the elutriate procedure.

4.3.1 Petroleum Hydrocarbons – Elutriate Method

Elutriate samples selected for Petroleum Hydrocarbon Constituents are summarized in Table 7. The laboratory analytical results are located in Appendix C.

As shown in the previous section, the highest TPH-DRO Level was the eastern end of the channel closest to the MARAD Bulkhead.

Table 7: Elutriate Analytical Summary: Petroleum Hydrocarbons

Sample ID	Parameter	Result	RL	Units
ELUTRIATE-1 Composite of SS-1 and SS-2	TPH-DRO	850	100	ug/L
ELUTRIATE-2 Composite of SS-3 and SS-4	TPH-DRO	290	100	ug/L

RL – Laboratory Reporting Limit

4.3.2 Kepone– Elutriate Method

The Elutriate samples were also analyzed for Kepone. Elutriate samples selected for Kepone are summarized in Table 8. As shown in the previous section, none of the analytical results were above detection limits for the samples collected for Kepone. Complete lists of Kepone original laboratory results are included in Appendix C.

Table 8: Elutriate Analytical Summary: Kepone

Sample ID	Parameter	Result	RL	Units
ELUTRIATE-1 Composite of SS-1 and SS-2	Kepone	ND	80	ug/L
ELUTRIATE-2 Composite of SS-3 and SS-4	Kepone	ND	80	ug/L

RL – Laboratory Reporting Limit
ND – Non Detectable Concentration

4.3.3 TCL-PAHs– Elutriate Method

Elutriate samples were also analyzed for TCL-PAH constituents. No samples exceeded the RBCs for each individual analyte. A complete list of PAHs constituents and original laboratory results are included in Appendix C.

4.3.4 TAL-Metals– Elutriate Method

Elutriate samples were analyzed for TAL-Metal constituents. Analytical results reported near or above the detection limits for these samples are displayed in Table 9. Detectable concentrations were then compared to the VDEQ Water Quality Standards (WQS). This comparison is made to WQS values for waters for acute and chronic health criteria in aquatic life in freshwater environments, as well human health criteria for both public water systems and all other surface waters. A complete list of TAL-Metals original laboratory results is included in Appendix C.

Table 9: Elutriate Analytical Summary: TAL-Metals Constituents Above Detection Limits

Sample ID	Parameter	Result	RL	Aquatic Life		Human Health		Units
				Freshwater		PWS	AOSW	
				Acute	Chronic			
ELUTRIATE-1 Composite of SS-1 and SS-2	Aluminum	947 E	200	**	**	**	**	ug/L
	Calcium	79,700	5,000	**	**	**	**	ug/L
	Iron	1350	100	**	**	300	**	ug/L
	Potassium	119,000	5,000	**	**	**	**	ug/L
	Magnesium	214,000	5,000	**	**	**	**	ug/L
	Manganese	603	15.0	**	**	50	**	ug/L
	Mercury	ND	0.20	2.4	0.012	0.052	0.053	ug/L
	Sodium	1,820,000	25,000	**	**	**	**	ug/L
	Thallium	10.6	10.0	**	**	**	**	ug/L
	Zinc	22.3	20.0	120	110	5000	**	ug/L
ELUTRIATE-2 Composite of SS-3 and SS-4	Aluminum	1240	200	**	**	**	**	ug/L
	Barium	208	200	**	**	2,000	**	ug/L
	Calcium	71,100	5,000	**	**	**	**	ug/L
	Iron	1,560	100	**	**	300	**	ug/L
	Potassium	123,000	5,000	**	**	**	**	ug/L
	Magnesium	213,000	5,000	**	**	**	**	ug/L
	Manganese	1000	15.0	**	**	50	**	ug/L
	Mercury	ND	0.20	2.4	0.012	0.052	0.053	ug/L
	Sodium	1,790,000	25,000	**	**	**	**	ug/L
	Lead	3.4	3.0	**	**	**	**	ug/L
	Thallium	12.8	10.0	**	**	**	**	ug/L
	Zinc	25.5	20.0	120	110	5000	**	ug/L

PWS - Public water supplies
AOSW - All other surface waters
E - Matrix Interference
** - No Level is issued for this Analyte

For the constituents where water quality criteria exist, none of the analyzed dissolved metals exceed those standards.

5.0 CONCLUSIONS

Arsenic, in SS-2 and SS-4, was the only TAL-Metal during this sampling investigation analyzed at levels above the RBC and above the historical sediments metals concentrations. However both sample were within the same order of magnitude. Detectable concentrations for the elutriate sediment samples (Table 9) were also compared to risk assessment values listed for parameters in freshwater environments used by humans as public water supplies, and all other bodies of surface water used by humans. These regulatory values are higher than the levels of the Metals detected in the sediment at the subject property.

Based on the analytical results listed in Table 3, TCL-PAHs constituents are present in the sediment. The TCL-PAHs concentrations detected in the sediment at the subject property are significantly less than the RBC values for sediment in an industrial setting.

The sediment samples were also analyzed for kepone. Based on the analytical results of the sediment samples, kepone was not detected in the sediment at the subject property.

Based on this investigation, TPH-DRO appears to be the only constituent of any concern. Levels of TPH-DRO / GRO have been detected but not above any VDEQ regulatory limit as detailed in 9 VAC 25-580, 1987. A majority of this contaminant is close in to the MARAD docks, and diminishes as the channel extends to toward the river.

Based on the information presented in this document, IMS feels that there are not any Hazardous and Toxic Waste issues at the proposed dredging location.

REFERENCES CITED

Virginia Department of Environmental Quality
Historical Sediment Metals - James River Basin
ftp://ftp.deq.state.va.us/pub/watqual/toxics/sm2.xls

U.S. Environmental Protection Agency
Risk Based Concentration Table
http://www.epa.gov/reg3hwmd/risk/rbc1002.pdf

U.S.G.S. 7.5-Minute Topographic Map of the Williamsburg, Virginia Quadrangle. Photorevised 1986. Scale 1:24,000.

9 VAC 25-580, 1987, Underground Storage Tanks: Technical Standards and Corrective Action Requirements.

FIGURES

APPENDIX A

Photodocumentation

Photo #1

Photo #2

Photo #3

Photo #1 Retrieval of Sediment Boring SS-1

Photo #2 Sediment Boring at SS-2

Photo #3 Sediment Boring at SS-3

APPENDIX B

EPA Region III RBC Table

APPENDIX C

Laboratory Analytical Results

Site Water Analytical Results

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210168 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SITE WATER

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	5.0	ug/L	SW846 6010B	
Aluminum	**340**	**200**	**ug/L**	**SW846 6010B**	
Arsenic	ND	10.0	ug/L	SW846 6010B	
Barium	**83.8 B**	**200**	**ug/L**	**SW846 6010B**	
Beryllium	**0.64 B**	**4.0**	**ug/L**	**SW846 6010B**	
Calcium	**90000**	**5000**	**ug/L**	**SW846 6010B**	
Cadmium	ND	5.0	ug/L	SW846 6010B	
Cobalt	ND	50.0	ug/L	SW846 6010B	
Chromium	**1.2 B**	**5.0**	**ug/L**	**SW846 6010B**	
Copper	**2.7 B**	**25.0**	**ug/L**	**SW846 6010B**	
Iron	**111**	**100**	**ug/L**	**SW846 6010B**	
Potassium	**105000 E**	**5000**	**ug/L**	**SW846 6010B**	
Magnesium	**222000**	**5000**	**ug/L**	**SW846 6010B**	
Manganese	**17.2**	**15.0**	**ug/L**	**SW846 6010B**	
Sodium	**1750000**	**25000**	**ug/L**	**SW846 6010B**	
Nickel	ND	40.0	ug/L	SW846 6010B	
Lead	ND	3.0	ug/L	SW846 6010B	
Antimony	ND	10.0	ug/L	SW846 6010B	
Selenium	ND	5.0	ug/L	SW846 6010B	
Thallium	ND	10.0	ug/L	SW846 6010B	
Vanadium	**5.3 B**	**50.0**	**ug/L**	**SW846 6010B**	
Zinc	**10.3 B**	**20.0**	**ug/L**	**SW846 6010B**	
Mercury in Liquid Waste (Manual Cold-Vapor)					Reviewed
Mercury	ND	0.20	ug/L	SW846 7470A	

B Estimated result. Result is less than RL.

E Matrix interference.

Volatiles by GC					Reviewed
Benzene	ND	1.0	ug/L	SW846 8021B	
Ethylbenzene	ND	1.0	ug/L	SW846 8021B	
Toluene	ND	1.0	ug/L	SW846 8021B	
Xylenes (total)	ND	1.0	ug/L	SW846 8021B	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210168 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SITE WATER

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Kepone	ND	38	ug/L	SW846 8270C	
8270C (SIM)					Reviewed
Naphthalene	ND	0.19	ug/L	SW846 8270C SIM	
Acenaphthylene	ND	0.19	ug/L	SW846 8270C SIM	
Acenaphthene	ND	0.19	ug/L	SW846 8270C SIM	
Fluorene	ND	0.19	ug/L	SW846 8270C SIM	
Phenanthrene	ND	0.19	ug/L	SW846 8270C SIM	
Anthracene	ND	0.19	ug/L	SW846 8270C SIM	
Fluoranthene	ND	0.19	ug/L	SW846 8270C SIM	
Pyrene	ND	0.19	ug/L	SW846 8270C SIM	
Benzo(a)anthracene	ND	0.19	ug/L	SW846 8270C SIM	
Chrysene	ND	0.19	ug/L	SW846 8270C SIM	
Benzo(b)fluoranthene	ND	0.19	ug/L	SW846 8270C SIM	
Benzo(k)fluoranthene	ND	0.19	ug/L	SW846 8270C SIM	
Benzo(a)pyrene	ND	0.19	ug/L	SW846 8270C SIM	
Indeno(1,2,3-cd)pyrene	ND	0.19	ug/L	SW846 8270C SIM	
Dibenzo(a,h)anthracene	ND	0.19	ug/L	SW846 8270C SIM	
Benzo(ghi)perylene	ND	0.19	ug/L	SW846 8270C SIM	
Extractable Petroleum Hydrocarbons					Reviewed
TPH (as Diesel)	ND	100	ug/L	SW846 8015B	
Volatile Petroleum Hydrocarbons					Reviewed
TPH (as Gasoline)	ND	100	ug/L	SW846 8015B	

Sediment Samples – Totals Analytical Results

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services PAGE 1

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-1

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	0.48	mg/kg	SW846 6010B	
Aluminum	**4420**	**19.2**	**mg/kg**	**SW846 6010B**	
Arsenic	**3.5**	**0.96**	**mg/kg**	**SW846 6010B**	
Barium	**29.3**	**19.2**	**mg/kg**	**SW846 6010B**	
Beryllium	**0.71**	**0.38**	**mg/kg**	**SW846 6010B**	
Calcium	**836**	**480**	**mg/kg**	**SW846 6010B**	
Cadmium	**0.35 B**	**0.48**	**mg/kg**	**SW846 6010B**	
Cobalt	**3.6 B**	**4.8**	**mg/kg**	**SW846 6010B**	
Chromium	**14.1**	**0.48**	**mg/kg**	**SW846 6010B**	
Copper	**37.3 N***	**2.4**	**mg/kg**	**SW846 6010B**	
Iron	**14800**	**9.6**	**mg/kg**	**SW846 6010B**	
Potassium	**709**	**480**	**mg/kg**	**SW846 6010B**	
Magnesium	**1220**	**480**	**mg/kg**	**SW846 6010B**	
Manganese	**112**	**1.4**	**mg/kg**	**SW846 6010B**	
Sodium	**1740**	**480**	**mg/kg**	**SW846 6010B**	
Nickel	**9.4**	**3.8**	**mg/kg**	**SW846 6010B**	
Lead	**57.2 N***	**0.29**	**mg/kg**	**SW846 6010B**	
Antimony	**0.77 BN**	**0.96**	**mg/kg**	**SW846 6010B**	
Selenium	ND	0.48	mg/kg	SW846 6010B	
Thallium	**0.74 B**	**0.96**	**mg/kg**	**SW846 6010B**	
Vanadium	**49.3 N**	**4.8**	**mg/kg**	**SW846 6010B**	
Zinc	**115 N***	**1.9**	**mg/kg**	**SW846 6010B**	
Mercury in Solid Waste (Manual Cold-Vapor)					Reviewed
Mercury	**0.14**	**0.032**	**mg/kg**	**SW846 7471A**	

B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

Volatiles by GC					Reviewed
Benzene	ND	1.7	ug/kg	SW846 8021B	
Ethylbenzene	ND	1.7	ug/kg	SW846 8021B	
Toluene	ND	1.7	ug/kg	SW846 8021B	
Xylenes (total)	ND	1.7	ug/kg	SW846 8021B	

Results and reporting limits have been adjusted for dry weight.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-1

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Kepone	ND	1300	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

8270C (SIM)					Reviewed
Naphthalene	**1.1 J**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Acenaphthylene	**8.8**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Acenaphthene	**4.5 J**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Fluorene	**6.4**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Phenanthrene	**18**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Anthracene	**14**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Fluoranthene	**100**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Pyrene	**52**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Benzo(a)anthracene	**30**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Chrysene	**42**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Benzo(b)fluoranthene	**63**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Benzo(k)fluoranthene	ND	6.4	ug/kg	SW846 8270C SIM	
Benzo(a)pyrene	**35**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Indeno(1,2,3-cd)pyrene	**30**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Dibenzo(a,h)anthracene	**13**	**6.4**	**ug/kg**	**SW846 8270C SIM**	
Benzo(ghi)perylene	**35**	**6.4**	**ug/kg**	**SW846 8270C SIM**	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Extractable Petroleum Hydrocarbons					Reviewed
TPH (as Diesel)	**89**	**87**	**mg/kg**	**SW846 8015B**	

Results and reporting limits have been adjusted for dry weight.

Volatile Petroleum Hydrocarbons					Reviewed
TPH (as Gasoline)	**2100**	**170**	**ug/kg**	**SW846 8015B**	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-1

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

Volatile Petroleum Hydrocarbons — Reviewed

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Total Residue as Percent Solids	**57.2**	**1.0**	**%**	**MCAWW 160.3 MOD**

Client Sample ID: SS-2

Sample #: 002 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Silver	**0.10 B**	**0.57**	**mg/kg**	**SW846 6010B**
Aluminum	**14100**	**22.6**	**mg/kg**	**SW846 6010B**
Arsenic	**7.5**	**1.1**	**mg/kg**	**SW846 6010B**
Barium	**66.4**	**22.6**	**mg/kg**	**SW846 6010B**
Beryllium	**1.5**	**0.45**	**mg/kg**	**SW846 6010B**
Calcium	**1330**	**565**	**mg/kg**	**SW846 6010B**
Cadmium	**0.53 B**	**0.57**	**mg/kg**	**SW846 6010B**
Cobalt	**10.0**	**5.7**	**mg/kg**	**SW846 6010B**
Chromium	**27.9**	**0.57**	**mg/kg**	**SW846 6010B**
Copper	**32.5 N***	**2.8**	**mg/kg**	**SW846 6010B**
Iron	**33700**	**11.3**	**mg/kg**	**SW846 6010B**
Potassium	**1990**	**565**	**mg/kg**	**SW846 6010B**
Magnesium	**3320**	**565**	**mg/kg**	**SW846 6010B**
Manganese	**484**	**1.7**	**mg/kg**	**SW846 6010B**
Sodium	**2440**	**565**	**mg/kg**	**SW846 6010B**
Nickel	**16.3**	**4.5**	**mg/kg**	**SW846 6010B**
Lead	**40.6 N***	**0.34**	**mg/kg**	**SW846 6010B**
Antimony	ND N	1.1	mg/kg	SW846 6010B
Selenium	ND	0.57	mg/kg	SW846 6010B
Thallium	**2.7**	**1.1**	**mg/kg**	**SW846 6010B**
Vanadium	**60.9 N**	**5.7**	**mg/kg**	**SW846 6010B**
Zinc	**195 N***	**2.3**	**mg/kg**	**SW846 6010B**

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-2

Sample #: 002 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Mercury in Solid Waste (Manual Cold-Vapor)					Reviewed
Mercury	**0.28**	**0.038**	**mg/kg**	**SW846 7471A**	

B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

Volatiles by GC					Reviewed
Benzene	ND	2.3	ug/kg	SW846 8021B	
Ethylbenzene	ND	2.3	ug/kg	SW846 8021B	
Toluene	ND	2.3	ug/kg	SW846 8021B	
Xylenes (total)	ND	2.3	ug/kg	SW846 8021B	

Results and reporting limits have been adjusted for dry weight.

Semivolatile Organic Compounds by GC/MS					Reviewed
Kepone	ND	1500	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

8270C (SIM)					Reviewed
Naphthalene	**1.2 J**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Acenaphthylene	**6.6 J**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Acenaphthene	**1.6 J**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Fluorene	**4.0 J**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Phenanthrene	**8.8**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Anthracene	**8.3**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Fluoranthene	**35**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Pyrene	**19**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Benzo(a)anthracene	**14**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Chrysene	**21**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Benzo(b)fluoranthene	**24**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Benzo(k)fluoranthene	ND	7.5	ug/kg	SW846 8270C SIM	
Benzo(a)pyrene	**15**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Indeno(1,2,3-cd)pyrene	**12**	**7.5**	**ug/kg**	**SW846 8270C SIM**	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-2

Sample #: 002 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
8270C (SIM)					Reviewed
Dibenzo(a,h)anthracene	**4.5 J**	**7.5**	**ug/kg**	**SW846 8270C SIM**	
Benzo(ghi)perylene	**14**	**7.5**	**ug/kg**	**SW846 8270C SIM**	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Extractable Petroleum Hydrocarbons					Reviewed
TPH (as Diesel)	**30**	**23**	**mg/kg**	**SW846 8015B**	

Results and reporting limits have been adjusted for dry weight.

Volatile Petroleum Hydrocarbons					Reviewed
TPH (as Gasoline)	ND	230	ug/kg	SW846 8015B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	**44.2**	**1.0**	**%**	**MCAWW 160.3 MOD**	

Client Sample ID: SS-3

Sample #: 003 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	0.49	mg/kg	SW846 6010B	
Aluminum	**1850**	**19.5**	**mg/kg**	**SW846 6010B**	
Arsenic	**1.4**	**0.98**	**mg/kg**	**SW846 6010B**	
Barium	**9.7 B**	**19.5**	**mg/kg**	**SW846 6010B**	
Beryllium	**0.30 B**	**0.39**	**mg/kg**	**SW846 6010B**	
Calcium	**298 B**	**488**	**mg/kg**	**SW846 6010B**	
Cadmium	**0.067 B**	**0.49**	**mg/kg**	**SW846 6010B**	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-3

Sample #: 003 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Cobalt	**1.7 B**	**4.9**	**mg/kg**	**SW846 6010B**	
Chromium	**5.0**	**0.49**	**mg/kg**	**SW846 6010B**	
Copper	**4.1 N***	**2.4**	**mg/kg**	**SW846 6010B**	
Iron	**5120**	**9.8**	**mg/kg**	**SW846 6010B**	
Potassium	**380 B**	**488**	**mg/kg**	**SW846 6010B**	
Magnesium	**584**	**488**	**mg/kg**	**SW846 6010B**	
Manganese	**72.9**	**1.5**	**mg/kg**	**SW846 6010B**	
Sodium	**1040**	**488**	**mg/kg**	**SW846 6010B**	
Nickel	**2.5 B**	**3.9**	**mg/kg**	**SW846 6010B**	
Lead	**6.0 N***	**0.29**	**mg/kg**	**SW846 6010B**	
Antimony	ND N	0.98	mg/kg	SW846 6010B	
Selenium	ND	0.49	mg/kg	SW846 6010B	
Thallium	ND	0.98	mg/kg	SW846 6010B	
Vanadium	**10.3 N**	**4.9**	**mg/kg**	**SW846 6010B**	
Zinc	**27.5 N***	**2**	**mg/kg**	**SW846 6010B**	
Mercury in Solid Waste (Manual Cold-Vapor)					Reviewed
Mercury	**0.041**	**0.032**	**mg/kg**	**SW846 7471A**	

B Estimated result. Result is less than RL.

N Spiked analyte recovery is outside stated control limits.

Volatiles by GC					Reviewed
Benzene	ND	1.3	ug/kg	SW846 8021B	
Ethylbenzene	ND	1.3	ug/kg	SW846 8021B	
Toluene	ND	1.3	ug/kg	SW846 8021B	
Xylenes (total)	ND	1.3	ug/kg	SW846 8021B	

Results and reporting limits have been adjusted for dry weight.

Semivolatile Organic Compounds by GC/MS					Reviewed
Kepone	ND	1300	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-3

Sample #: 003 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
8270C (SIM)				Reviewed
Naphthalene	ND	6.5	ug/kg	SW846 8270C SIM
Acenaphthylene	**0.94 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Acenaphthene	ND	6.5	ug/kg	SW846 8270C SIM
Fluorene	ND	6.5	ug/kg	SW846 8270C SIM
Phenanthrene	**1.2 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Anthracene	**0.89 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Fluoranthene	**5.8 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Pyrene	**3.2 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Benzo(a)anthracene	**2.3 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Chrysene	**2.2 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Benzo(b)fluoranthene	**3.4 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Benzo(k)fluoranthene	ND	6.5	ug/kg	SW846 8270C SIM
Benzo(a)pyrene	**2.5 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Indeno(1,2,3-cd)pyrene	**1.9 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**
Dibenzo(a,h)anthracene	ND	6.5	ug/kg	SW846 8270C SIM
Benzo(ghi)perylene	**2.3 J**	**6.5**	**ug/kg**	**SW846 8270C SIM**

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Extractable Petroleum Hydrocarbons					Reviewed
TPH (as Diesel)	**8.4 J**	**13**	**mg/kg**	**SW846 8015B**	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Volatile Petroleum Hydrocarbons					Reviewed
TPH (as Gasoline)	ND	130	ug/kg	SW846 8015B	

Results and reporting limits have been adjusted for dry weight.

Inorganic Analysis					Reviewed
Total Residue as Percent Solids	**77.0**	**1.0**	**%**	**MCAWW 160.3 MOD**	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-4

Sample #: 004 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	0.54	mg/kg	SW846 6010B	
Aluminum	**18200**	**21.7**	**mg/kg**	**SW846 6010B**	
Arsenic	**8.9**	**1.1**	**mg/kg**	**SW846 6010B**	
Barium	**86.8**	**21.7**	**mg/kg**	**SW846 6010B**	
Beryllium	**1.7**	**0.43**	**mg/kg**	**SW846 6010B**	
Calcium	**1420**	**542**	**mg/kg**	**SW846 6010B**	
Cadmium	**0.55**	**0.54**	**mg/kg**	**SW846 6010B**	
Cobalt	**10.9**	**5.4**	**mg/kg**	**SW846 6010B**	
Chromium	**31.1**	**0.54**	**mg/kg**	**SW846 6010B**	
Copper	**30.3 N***	**2.7**	**mg/kg**	**SW846 6010B**	
Iron	**36200**	**10.8**	**mg/kg**	**SW846 6010B**	
Potassium	**2260**	**542**	**mg/kg**	**SW846 6010B**	
Magnesium	**3580**	**542**	**mg/kg**	**SW846 6010B**	
Manganese	**785**	**1.6**	**mg/kg**	**SW846 6010B**	
Sodium	**2700**	**542**	**mg/kg**	**SW846 6010B**	
Nickel	**17.5**	**4.3**	**mg/kg**	**SW846 6010B**	
Lead	**40.2 N***	**0.33**	**mg/kg**	**SW846 6010B**	
Antimony	ND N	1.1	mg/kg	SW846 6010B	
Selenium	ND	0.54	mg/kg	SW846 6010B	
Thallium	**2.3**	**1.1**	**mg/kg**	**SW846 6010B**	
Vanadium	**66.0 N**	**5.4**	**mg/kg**	**SW846 6010B**	
Zinc	**175 N***	**2.2**	**mg/kg**	**SW846 6010B**	
Mercury in Solid Waste (Manual Cold-Vapor)					Reviewed
Mercury	**0.35**	**0.036**	**mg/kg**	**SW846 7471A**	

N Spiked analyte recovery is outside stated control limits.

Volatiles by GC					Reviewed
Benzene	ND	2.2	ug/kg	SW846 8021B	
Ethylbenzene	ND	2.2	ug/kg	SW846 8021B	
Toluene	ND	2.2	ug/kg	SW846 8021B	
Xylenes (total)	ND	2.2	ug/kg	SW846 8021B	

Results and reporting limits have been adjusted for dry weight.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210162 IMS Env James River Ghost Fle **Date Reported:** 12/18/02

Project Number: IMS ENV

Client Sample ID: SS-4

Sample #: 004 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Kepone	ND	1400	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

8270C (SIM)					Reviewed
Naphthalene	ND	7.2	ug/kg	SW846 8270C SIM	
Acenaphthylene	**3.3 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Acenaphthene	**0.89 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Fluorene	**2.4 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Phenanthrene	**5.6 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Anthracene	**2.6 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Fluoranthene	**12**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Pyrene	**12**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Benzo(a)anthracene	**6.5 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Chrysene	**7.7**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Benzo(b)fluoranthene	**5.2 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Benzo(k)fluoranthene	**7.1 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Benzo(a)pyrene	**8.7**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Indeno(1,2,3-cd)pyrene	**5.3 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Dibenzo(a,h)anthracene	**2.4 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	
Benzo(ghi)perylene	**7.0 J**	**7.2**	**ug/kg**	**SW846 8270C SIM**	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Extractable Petroleum Hydrocarbons					Reviewed
TPH (as Diesel)	**6.0 J**	**22**	**mg/kg**	**SW846 8015B**	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Volatile Petroleum Hydrocarbons					Reviewed
TPH (as Gasoline)	ND	220	ug/kg	SW846 8015B	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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IMS Environmental Services

Lot #: C2K210162

IMS Env James River Ghost Fle

Date Reported: 12/18/02

Project Number: IMS ENV

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: SS-4				
Sample #: 004 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID				
Volatile Petroleum Hydrocarbons				Reviewed
Results and reporting limits have been adjusted for dry weight.				
Inorganic Analysis				Reviewed
Total Residue as Percent Solids	**46.1**	**1.0**	**%**	**MCAWW 160.3 MOD**

Elutriate Analytical Results

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210182 IMS Env James River Ghost Fle **Date Reported:** 12/19/02

Project Number: IMS ENV

Client Sample ID: ELUTRIATE-1

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER		RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Trace Inductively Coupled Plasma (ICP) Metals						Reviewed
Silver	Dissolved	ND	5.0	ug/L	SW846 6010B	
Aluminum	**Dissolved**	**947 E**	**200**	**ug/L**	**SW846 6010B**	
Arsenic	**Dissolved**	**4.9 B**	**10.0**	**ug/L**	**SW846 6010B**	
Barium	**Dissolved**	**198 B**	**200**	**ug/L**	**SW846 6010B**	
Beryllium	**Dissolved**	**2.4 B**	**4.0**	**ug/L**	**SW846 6010B**	
Calcium	**Dissolved**	**79700**	**5000**	**ug/L**	**SW846 6010B**	
Cadmium	**Dissolved**	**0.32 B**	**5.0**	**ug/L**	**SW846 6010B**	
Cobalt	**Dissolved**	**2.7 B**	**50.0**	**ug/L**	**SW846 6010B**	
Chromium	Dissolved	ND	5.0	ug/L	SW846 6010B	
Copper	**Dissolved**	**4.6 B**	**25.0**	**ug/L**	**SW846 6010B**	
Iron	**Dissolved**	**1350**	**100**	**ug/L**	**SW846 6010B**	
Potassium	**Dissolved**	**119000 E**	**5000**	**ug/L**	**SW846 6010B**	
Magnesium	**Dissolved**	**214000**	**5000**	**ug/L**	**SW846 6010B**	
Manganese	**Dissolved**	**603**	**15.0**	**ug/L**	**SW846 6010B**	
Sodium	**Dissolved**	**1820000**	**25000**	**ug/L**	**SW846 6010B**	
Nickel	**Dissolved**	**5.4 B**	**40.0**	**ug/L**	**SW846 6010B**	
Lead	**Dissolved**	**2.3 B**	**3.0**	**ug/L**	**SW846 6010B**	
Antimony	Dissolved	ND	10.0	ug/L	SW846 6010B	
Selenium	**Dissolved**	**3.2 B**	**5.0**	**ug/L**	**SW846 6010B**	
Thallium	**Dissolved**	**10.6**	**10.0**	**ug/L**	**SW846 6010B**	
Vanadium	**Dissolved**	**12.2 B**	**50.0**	**ug/L**	**SW846 6010B**	
Zinc	**Dissolved**	**22.3**	**20.0**	**ug/L**	**SW846 6010B**	
Mercury in Liquid Waste (Manual Cold-Vapor)						Reviewed
Mercury	Dissolved	ND	0.20	ug/L	SW846 7470A	

E Matrix interference.

B Estimated result. Result is less than RL.

Semivolatile Organic Compounds by GC/MS - Dissolved						Reviewed
Kepone		ND	80	ug/L	SW846 8270C	
8270C (SIM) - Dissolved						Reviewed
Acenaphthene		**0.088 J**	**0.40**	**ug/L**	**SW846 8270C SIM**	
Acenaphthylene		ND	0.40	ug/L	SW846 8270C SIM	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210182 IMS Env James River Ghost Fle **Date Reported:** 12/19/02

Project Number: IMS ENV

Client Sample ID: ELUTRIATE-1

Sample #: 001 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

8270C (SIM) - Dissolved — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Anthracene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(a)anthracene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(b)fluoranthene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(k)fluoranthene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(a)pyrene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(ghi)perylene	ND	0.40	ug/L	SW846 8270C SIM
Chrysene	ND	0.40	ug/L	SW846 8270C SIM
Dibenzo(a,h)anthracene	ND	0.40	ug/L	SW846 8270C SIM
Fluoranthene	**0.081 J**	**0.40**	**ug/L**	**SW846 8270C SIM**
Fluorene	ND	0.40	ug/L	SW846 8270C SIM
Indeno(1,2,3-cd)pyrene	ND	0.40	ug/L	SW846 8270C SIM
Naphthalene	ND	0.40	ug/L	SW846 8270C SIM
Phenanthrene	**0.088 J**	**0.40**	**ug/L**	**SW846 8270C SIM**
Pyrene	**0.096 J**	**0.40**	**ug/L**	**SW846 8270C SIM**

J Estimated result. Result is less than RL.

Inorganic Analysis — Reviewed

Total Residue as Percent Solids	**52.0**	**1.0**	**%**	**MCAWW 160.3 MOD**

Client Sample ID: ELUTRIATE-2

Sample #: 002 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

Trace Inductively Coupled Plasma (ICP) Metals — Reviewed

Silver	Dissolved	ND	5.0	ug/L	SW846 6010B
Aluminum	**Dissolved**	**1240**	**200**	**ug/L**	**SW846 6010B**
Arsenic	**Dissolved**	**7.4 B**	**10.0**	**ug/L**	**SW846 6010B**
Barium	**Dissolved**	**208**	**200**	**ug/L**	**SW846 6010B**
Beryllium	**Dissolved**	**2.5 B**	**4.0**	**ug/L**	**SW846 6010B**
Calcium	**Dissolved**	**71100**	**5000**	**ug/L**	**SW846 6010B**
Cadmium	**Dissolved**	**0.53 B**	**5.0**	**ug/L**	**SW846 6010B**
Cobalt	**Dissolved**	**2.7 B**	**50.0**	**ug/L**	**SW846 6010B**

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

IMS Environmental Services

Lot #: C2K210182 IMS Env James River Ghost Fle **Date Reported:** 12/19/02

Project Number: IMS ENV

Client Sample ID: ELUTRIATE-2

Sample #: 002 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID

PARAMETER		RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Chromium	**Dissolved**	**2.4 B**	**5.0**	**ug/L**	**SW846 6010B**
Copper	**Dissolved**	**4.5 B**	**25.0**	**ug/L**	**SW846 6010B**
Iron	**Dissolved**	**1560**	**100**	**ug/L**	**SW846 6010B**
Potassium	**Dissolved**	**123000**	**5000**	**ug/L**	**SW846 6010B**
Magnesium	**Dissolved**	**213000**	**5000**	**ug/L**	**SW846 6010B**
Manganese	**Dissolved**	**1000**	**15.0**	**ug/L**	**SW846 6010B**
Sodium	**Dissolved**	**1790000**	**25000**	**ug/L**	**SW846 6010B**
Nickel	**Dissolved**	**4.0 B**	**40.0**	**ug/L**	**SW846 6010B**
Lead	**Dissolved**	**3.4**	**3.0**	**ug/L**	**SW846 6010B**
Antimony	Dissolved	ND	10.0	ug/L	SW846 6010B
Selenium	Dissolved	ND	5.0	ug/L	SW846 6010B
Thallium	**Dissolved**	**12.8**	**10.0**	**ug/L**	**SW846 6010B**
Vanadium	**Dissolved**	**14.4 B**	**50.0**	**ug/L**	**SW846 6010B**
Zinc	**Dissolved**	**25.5**	**20.0**	**ug/L**	**SW846 6010B**

Mercury in Liquid Waste (Manual Cold-Vapor) Reviewed

Mercury	Dissolved	ND	0.20	ug/L	SW846 7470A

B Estimated result. Result is less than RL.

Semivolatile Organic Compounds by GC/MS - Dissolved Reviewed

Kepone	ND	80	ug/L	SW846 8270C

8270C (SIM) - Dissolved Reviewed

Acenaphthene	ND	0.40	ug/L	SW846 8270C SIM
Acenaphthylene	ND	0.40	ug/L	SW846 8270C SIM
Anthracene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(a)anthracene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(b)fluoranthene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(k)fluoranthene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(a)pyrene	ND	0.40	ug/L	SW846 8270C SIM
Benzo(ghi)perylene	ND	0.40	ug/L	SW846 8270C SIM
Chrysene	ND	0.40	ug/L	SW846 8270C SIM
Dibenzo(a,h)anthracene	ND	0.40	ug/L	SW846 8270C SIM
Fluoranthene	ND	0.40	ug/L	SW846 8270C SIM
Fluorene	ND	0.40	ug/L	SW846 8270C SIM

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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IMS Environmental Services

Lot #: C2K210182 IMS Env James River Ghost Fle **Date Reported:** 12/19/02

Project Number: IMS ENV

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Client Sample ID: ELUTRIATE-2				
Sample #: 002 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: SOLID				
8270C (SIM) - Dissolved				Reviewed
Indeno(1,2,3-cd)pyrene	ND	0.40	ug/L	SW846 8270C SIM
Naphthalene	ND	0.40	ug/L	SW846 8270C SIM
Phenanthrene	ND	0.40	ug/L	SW846 8270C SIM
Pyrene	**0.050 J**	**0.40**	**ug/L**	**SW846 8270C SIM**
J Estimated result. Result is less than RL.				
Inorganic Analysis				Reviewed
Total Residue as Percent Solids	**53.0**	**1.0**	**%**	**MCAWW 160.3 MOD**
Client Sample ID: ELUTRIATE-1				
Sample #: 003 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: WATER				
Extractable Petroleum Hydrocarbons				Reviewed
TPH (as Diesel)	**850**	**100**	**ug/L**	**SW846 8015B**
Client Sample ID: ELUTRIATE-2				
Sample #: 004 Date Sampled: 11/19/02 Date Received: 11/21/02 Matrix: WATER				
Extractable Petroleum Hydrocarbons				Reviewed
TPH (as Diesel)	**290**	**100**	**ug/L**	**SW846 8015B**

Appendix C

Consultation Letters and Responses

September 25, 2002

J. Christopher Ludwig
Department of Conservation and Recreation
Division of Natural Heritage
217 Governor St., 3rd Floor
Richmond, VA 23219

Dear Mr. Ludwig:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your further input concerning this action with regard to any biological concerns, such as essential fish habitat, threatened and endangered species, or other species under your cognizance. For quick reference, the project area can be found on the attached location map of Fort Eustis.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 25 October 2002. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PL-R, 803 Front Street, Norfolk, VA 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment mid-November 2002.

Your prompt consideration and response is greatly appreciated. If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.

Sincerely,

Richard J. Muller
ATTCH: A/S

September 25, 2002

Mr. Timothy E. Goodger, Officer in Charge
National Marine Fisheries Service
Habitat Conservation District
904 South Morris Street
Oxford, MD 21654

Dear Mr. Goodger:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your further input concerning this action with regard to any biological concerns, such as essential fish habitat, threatened and endangered species, or other species under your cognizance. For quick reference, the project area can be found on the attached location map of Fort Eustis.

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Your prompt consideration and response is greatly appreciated. If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.
Sincerely,

Richard J. Muller

ATTCH: A/S

September 25, 2002

Ms. Karen Mayne
U.S. Fish and Wildlife Service
Division of Ecological Services
P.O. Box 99
Gloucester, VA 23061

Dear Ms. Mayne:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your further input concerning this action with regard to any biological concerns, such as essential fish habitat, threatened and endangered species, or other species under your cognizance. For quick reference, the project area can be found on the attached location map of Fort Eustis.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 25 October 2002. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PL-R, 803 Front Street, Norfolk, VA 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment mid-November 2002.

Your prompt consideration and response is greatly appreciated. If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.
Sincerely,

Richard J. Muller
ATTCH: A/S

September 25, 2002

Mr. Raymond T. Fernald
Virginia Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230

Dear Mr. Fernald:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your further input concerning this action with regard to any biological concerns, such as essential fish habitat, threatened and endangered species, or other species under your cognizance. For quick reference, the project area can be found on the attached location map of Fort Eustis.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 25 October 2002. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PL-R, 803 Front Street, Norfolk, VA 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment mid-November 2002.

Your prompt consideration and response is greatly appreciated. If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.

Sincerely,

Richard J. Muller

ATTCH: A/S

September 25, 2002

Mr. Robert Grabb, Chief
Virginia Marine Resources Commission
Habitat Management Division
2600 Washington Avenue
Newport News, VA 23607

Dear Mr. Grabb:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your further input concerning this action with regard to any biological concerns, such as essential fish habitat, threatened and endangered species, or other species under your cognizance. For quick reference, the project area can be found on the attached location map of Fort Eustis.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 25 October 2002. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PL-R, 803 Front Street, Norfolk, VA 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment mid-November 2002.

Your prompt consideration and response is greatly appreciated. If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.

Sincerely,

Richard J. Muller
ATTCH: A/S

November 21, 2002

John Olney
Virginia Institute of Marine Science
P.O. Box 1346
Gloucester Point, Virginia 23062-1346

Dear Mr. Olney:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia. While coordinating with the Virginia Department of Game and Inland Fisheries, Tom Wilcox recommended we consult you concerning potential project impacts to fish spawning, specifically striped bass (*Morone saxatilis*).

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to a depth of –16 feet MLLW (mean lower low water) for a length of 8,300 feet from deep water in the James River into Skiffes Creek, including two turning basins, variable in width and 1,600 and 1,440 feet in length, to a depth of –15 MLLW. The estimated yardage of dredged material to be disposed is 450,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –12 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length and variable in width, no wider than approximately 420 feet. The estimated yardage of dredged material to be disposed is 170,000 cubic yards. The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 35 feet, using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged.

In accordance with the National Environmental Policy Act, Endangered Species Act, and Fish and Wildlife Coordination Act, an evaluation of the potential impacts (both positive and negative) associated with implementing this action is required. We are requesting your further input concerning this action with regard to any biological concerns, such as essential fish habitat, threatened and endangered species, or other species under your cognizance. For quick reference, the project area can be found on the attached location map of Fort Eustis.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 24 December 2002. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PL-R, 803 Front Street, Norfolk, VA 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment winter 2002.

Your prompt consideration and response is greatly appreciated. If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.
Sincerely,

Richard J. Muller
ATTCH: A/S

30 January 2002

Programs and Project Management Division
Environmental Branch

Kathleen Kilpatrick
State Historic Preservation Officer
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Ms. Kilpatrick:

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District are preparing an Environmental Assessment which will evaluate the potential environmental effects associated with the proposed maintenance dredging of Skiffes Creek and the U.S. Maritime Administration (MARAD) Facility Access Channel.

The Army and MARAD propose to remove approximately 680,000 cubic yards of material from the existing channels. The dredging will be to approved connecting depths in the James River. The dredged material will be placed in the Fort Eustis Dredged Material Management Area (FEDMMA) an upland dredged material placement area on Fort Eustis. It will be necessary for the Army to expand the volumetric capacity of the FEDMMA to accommodate additional dredged material by raising the containment dikes from their present elevation of approximately +20 feet mean sea level (m.s.l.) to approximately +30 feet m.s.l. The outward toe and face of the dikes will remain unchanged, with the crest of the dikes moved inward with the increased elevation. A map that shows the project area is attached to this letter.

To assist us in our evaluation of the project, please submit any comments or concerns you may have about the project by 12 February 2003. Please address all comments to: Mr. Richard Muller, U.S. Army Corps of Engineers, Norfolk District, Attn: CENAO-PM-E, 803 Front Street, Norfolk, Virginia 23510-1096 (Email: richard.j.muller@usace.army.mil). Your comments/concerns will be addressed in the Environmental Assessment that will be available for public comment.

If you need additional information please call me at (757) 441-7767. Thank you for your cooperation.

Sincerely,

Richard J. Muller
Project Manager

ATTCH: A/S

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

October 25, 2002

Richard J. Muller
U.S. Army Corps of Engineers
Norfolk District, Attn: CENAO-PL-R
803 Front Street
Norfolk, VA 23510-1096

Re: Dredging of Skiffes Creek Channel and MARAD Facility Access Channel

Dear Mr. Muller:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

BCD documents the presence of natural heritage resources in the project area. However, due to the scope of the activity and the distance to the resource, we do not anticipate that this project will adversely impact these natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

An absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

Thank you for the opportunity to comment on this project.

Sincerely,

Elizabeth Locklear
Locality Liaison

An Agency of the Natural Resources Secretariat

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

October 28, 2002

Mr. Richard Muller
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510-1096

Re: Fort Eustis Dredging Project,
2572, City of Newport News, VA

Dear Mr. Muller:

The U.S. Fish and Wildlife Service has reviewed your September 26, 2002 request for information on federally listed species for the referenced project. This letter is submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The U.S. Army proposes to dredge the Skiffes Creek Channel and the U.S. Maritime Administration Facility Access Channel. The approximately 620,000 cubic yards of dredged material would be disposed of in the Fort Eustis Dredged Material Management Area. Based on the project description and location, it appears that this project is not likely to adversely affect any federally listed or proposed species or their designated critical habitat.

If you have any questions or need further assistance concerning this project, contact Ms. Jolie Harrison at (804) 693-6694, extension 208.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

October 4, 2002

Richard J. Muller
Project Manager
USACOE, Norfolk District
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

RE: ESSLOG #18118, Fort Eustis Dredging Projects

Dear Mr. Muller:

This letter is in response to your request for information related to the presence of threatened or endangered species in the vicinity of the above referenced project.

1. **Skiffes Creek Channel Dredging. The *state and federal threatened* bald eagle (*Haliaeetus leucocephalus*) has been documented in the project area. The applicant should coordinate with this Department and with the U.S. Fish and Wildlife Service to evaluate potential impacts on this species.**

   In addition, the project is located in a stream reach that contains documented occurrences of striped bass (*Morone saxatilis*) and the *federal species of concern/state special concern* Atlantic sturgeon (*Acipenser oxyrhynchus*). The applicant should coordinate with this Department regarding potential impacts to these species.

   Block surveys adjacent to the project site also documented the following *state special concern* species during the breeding season: great egret (*Ardea alba*), northern harrier (*Circus cyaneus*), and least tern (*Sterna antillarum*). These species may occur at the project site if appropriate habitat exists, but no coordination is required.

2. **FEDMMA. The project is located within 0.5 mile of a stream reach that contains documented occurrences of striped bass and the *federal species of concern/state special concern* Atlantic sturgeon. The applicant should coordinate with this Department regarding potential impacts to these species.**

   In addition, block surveys adjacent to the project site documented the *state and federal* threatened bald eagle, as well as the following *state special concern* species during the breeding season: great egret, northern harrier, and least tern. These species may occur at the project site if appropriate habitat exists, but no coordination is required at this time.

3. **MARAD Facility Access Channel Dredging. . The *state and federal threatened* bald eagle and the *state* threatened peregrine falcon (*Falco peregrinus*) have been documented in the project area. The applicant should coordinate with this Department and with the U.S. Fish and Wildlife Service to evaluate potential impacts on this species.**

   In addition, the project is located in a stream reach that contains documented occurrences of striped bass and the *federal species of concern/state special concern* Atlantic sturgeon. The applicant should coordinate with this Department regarding potential impacts to these species.

   Finally, block surveys adjacent to the project site documented the following *state special concern* species during the breeding season: great egret, northern harrier, and least tern. These species may occur at the project site if appropriate habitat exists, but no coordination is required at this time.

Information about fish and wildlife species was generated from our agency's computerized Fish and Wildlife Information System, which describes animals that are known or may occur in a particular geographic area. Field surveys may be necessary to determine the presence or absence of some of these species on or near the proposed area. Also, additional sensitive animal species may be present, but their presence has not been documented in our information system.

Endangered plants and insects are under the jurisdiction of the Virginia Department of Agriculture and Consumer Services, Bureau of Plant Protection. Questions concerning sensitive plant and insect species occurring at the project site should be directed to Keith Tignor at (804) 786-3515.

There is no processing charge for our response.

This letter summarizes the likelihood of the occurrence of endangered or threatened animal species at the project site. If you have additional questions in this regard, please contact me at (804) 367-8001. Please note that this response does not address any other environmental concerns; these issues are analyzed by our Environmental Services Section, in conjunction with interagency review of applications for state and federal permits. If you have any questions in this regard, please contact Tom Wilcox or Brian Moyer at (804) 367-6913.

Please note that the data used to develop this response are continually updated. Therefore, if significant changes are made to your project or if the project has not begun within 6 months of receiving this letter, then the applicant should request a new review of our data.

The Fish and Wildlife Information Service, the system of databases used to provide the information in this letter, can now be accessed via the Internet! The Service currently provides access to current and comprehensive information about all of Virginia's fish and wildlife resources, including those listed as threatened, endangered, or special concern; colonial birds; waterfowl; trout streams; and all wildlife. Users can choose a geographic location and generate a report of species known or likely to occur around that point. From our main web page, at www.dgif.state.va.us, choose the hyperlink to "Wildlife", then "Wildlife Information & Mapping Services" and then "Wildlife Information Online Service". For more information, please contact Amy Martin, Online Service Coordinator, at (804) 367-2211.

Thank you for your interest in the wildlife resources of Virginia.

Sincerely,

W. Adam Phelps
Wildlife Biologist

cc: R.T. Fernald, VDGIF
Eric Davis, USFWS

COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Marine Resources Commission
2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

William A. Pruitt
Commissioner

October 29, 2002

Department of the Army
Programs and Project Management Division
Environmental Branch
Attn: Richard J. Muller
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, VA 23510-1096

Re: Environmental Assessment
U. S. Army Transportation Center

Dear Mr. Muller:

This will acknowledge receipt of your request for comments or concerns related to potential environmental effects associated with the proposed dredging of two unconnected but neighboring federal navigation channels accessing facilities on the eastern shoreline of the James River and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on and adjacent to Fort Eustis, Virginia.

First, VMRC would recommend the submittal of a Joint Permit Application for the proposed work. Potential areas of concern could be potential impacts to anadramous fish migration, oyster ground impacts, both public and private, as well as potential impacts to any endangered species that may be located within or adjacent to the proposed dredge areas.

Thank you for the opportunity to comment on this project. If you have any questions, please feel free to call me at 757-247-2009.

Sincerely,

Ben Stagg
Environmental Engineer

BS/lmn
HM

Appendix D

Coastal Zone Consistency Determination

January 17, 2003

Ms. Ellie Irons
Virginia Department of Environmental Quality
Division of Environmental Enhancement
Office of Environmental Impact Review
629 East Main Street, 6th Floor
Richmond, VA 23240

Dear Ms. Irons:

Concerning the Coastal Zone Consistency (CZC) process for the proposed dredging of Skiffes Creek Channel and the U.S. Maritime Administration (MARAD) Facility Access Channel at Fort Eustis, Virginia, this letter represents our determination that the proposed action (dredging of the two aforementioned channels at Fort Eustis, Virginia) is consistent with the long-term goals and policies of the Virginia Coastal Resources Management Program (VCRMP).

The U.S. Army has proposed the dredging of the Skiffes Creek Channel and MARAD Facility Access Channel at Fort Eustis, Virginia. The proposed action would entail dredging the Skiffes Creek Channel to an average depth of –16 feet mean lower low water (MLLW) for a length of 8,300 feet and dredging the MARAD Facility Access Channel to a depth of –14 feet MLLW for a length of 2,800 feet. An estimated 680,000 cubic yards of material would be dredged. The dredged material would be hydraulically pumped through a 16-inch pipeline to the Fort Eustis Dredged Material Management Area (FEDMMA). Prior to the dredging of either Skiffes Creek Channel or the MARAD Facility Access Channel, the FEDMMA would be vertically expanded by raising the dike walls between 10 to 15 feet to achieve a minimum height of 30 feet above mean sea level. The outside footprint of the FEDMMA, which is surrounded by wetlands, would remain unchanged. Tetra Tech, Inc. is preparing an Environmental Assessment of the proposed action for the U.S. Army corps of Engineers, Norfolk District.

Following is a listing, by program, of how the proposed Army project would affect the enforceable regulatory programs comprising the VCRMP, the advisory policies for the geographic areas of particular concern, and the advisory policies for shorefront access planning and protection.

Enforceable Regulatory Programs

a. Fisheries Management

The Virginia Fisheries Management program stresses the need to take the measures "necessary to promote the general welfare of the seafood industry and to conserve and promote the seafood and marine resources of the Commonwealth." (VA Code § 28.2-201.1). The Virginia Marine Resources Commission has the authority to promulgate regulations, license, prepare fishery management plans, and enforce regulations as necessary to achieve the purposes of the program. The state of Virginia established the Department of Game and Inland Fisheries to ensure "the preservation and propagation of game birds, game animals, fish and other wildlife in order to increase, replenish and restock the lands and inland waters of the Commonwealth." (VA Code § 29.1-103.3)

Fisheries management issues are addressed in the Environmental Assessment (EA) for the Maintenance Dredging of the Skiffes Creek Channel and the MARAD Facility Access Channel,

and the Vertical Expansion of the FEDMMA. The document describes the affected aquatic environment, considers fish species observed at Fort Eustis during recent surveys, and discusses the issues potential contamination in sediments that would be dredged as part of the project. Nine federally managed fish species have Essential Fish Habitat in the project area. An Essential Fish Habitat Assessment has been compiled and submitted to the National Marine Fisheries Service.

As described in the EA, during the course of the project all necessary precautions will be taken to protect the aquatic habitats and aquatic organisms that could possibly be affected by the proposed activity. The measures proposed to be conducted include sampling and testing Kepone levels in the sediments before dredging, which have been undisturbed since 1968 in the MARAD Facility Access Channel; observing dredging restrictions in the James River from March 15th to June 30th to protect anadromous fish habitat; reparation of any wetlands disturbed by the hydraulic dredge line; and adherence strictly to legal procedures for the handling and disposal of all hazardous materials that are encountered.

b. Subaqueous Lands Management

The Subaqueous Lands Management Program makes it unlawful for any person, which includes the military, to build upon or over the beds of rivers, streams, or creeks that are the property of the Commonwealth of Virginia, unless the activity is done pursuant to a permit issued by the Virginia Marine Resources Commission (VA Code § 28.2-1203). Additionally, the program requires that "[a]ny person constructing or erecting any structure upon or over state-owned subaqueous bottoms, or their grantees or assignees for value, shall be responsible for the maintenance or removal of the structure upon its abandonment or its falling into a state of disrepair." (VA Code § 28.2-1209)

The proposed project does not involve building any structure upon or over the beds of rivers, streams, or creeks that are the property of the Commonwealth of Virginia.

c. Wetlands Management

Virginia's Tidal Wetlands Program recognizes the primary ecological significance of wetlands and encourages that development in tidewater Virginia be concentrated in wetlands of lesser ecological significance (VA Code § 28.2-1308). Under the program, it is "unlawful for any person to conduct any activity which would require a permit under a wetlands zoning ordinance without such a permit." (VA Code § 28.2-1306) Additionally, it is unlawful to excavate in a wetland in Virginia unless the excavation is done in compliance with an individual or general Virginia Water Protection Permit (VA Code § 62.1-44.15.5).

Wetlands are known to be in the general vicinity of the project area. The EA takes disturbance to wetlands into account by describing nearby wetland vegetation, analyzing the indirect and cumulative impacts that the proposed project may have on wetlands in the adjacent waters, and recommending mitigation measures to protect potentially affected wetlands, including reparation of any wetlands disturbed by the hydraulic dredge line.

d. Dunes Management

Any of the following counties, cities, and towns which have a wetlands zoning ordinance may adopt as well a coastal primary sand dune zoning ordinance: The counties of Accomack, Lancaster, Mathews, Northampton, and Northumberland; the cities of Hampton, Norfolk, and Virginia Beach; and the Town of Cape Charles (VA Code § 28.2-1403). Fort Eustis lies within

the city of Newport News and has a small parcel of land on the north shore of Skiffes Creek within York County.

Dune protection pursuant to the Coastal Primary Sand Dune Protection Act does not apply to the installation, as no primary sand dunes exist within the proposed project area or would be affected by the proposed project.

e. Non-point Source Pollution Control

Virginia's erosion and sediment control program was created "for the effective control of soil erosion, sediment deposition and nonagricultural runoff . . . to prevent the unreasonable degradation of properties, stream channels, waters and other natural resources." (VA Code § 10.1-561)

The proposed project will occur entirely within the channels to be dredged and the FEDMMA. No soil-disturbing activities are planned to occur during the proposed project, and thus the provisions of the erosion and sediment control program do not apply to the proposed project.

f. Point Source Pollution Control

A Virginia Water Protection Permit is required for point sources of pollution, per the provisions of the National Pollutant Discharge Elimination System permit program established under section 402 of the Clean Water Act.

No point sources of pollution exist within the vicinity of the proposed project area and the proposed project will not involve the use or creation of any point sources of pollution.

g. Shoreline Sanitation

The Virginia Shoreline Sanitation Program regulates the installation of septic tanks.

The proposed project does not include the installation, removal, or maintenance of septic tanks.

h. Air Pollution Control

The Virginia Air Pollution Control Program implements the federal Clean Air Act.

Fort Eustis lies within a maintenance area for ozone for National Ambient Air Quality Standards and has estimated that the air emissions due to the proposed project will not violate provisions of Virginia's State Implementation Plan. A Record of Non-applicability will be prepared in conjunction with the EA.

i. Coastal Lands Management

This project involves the removal of sediment from the James River and Skiffes Creek. The project does not involve any development.

Advisory Policies for Geographic Areas of Particular Concern

a. Coastal Natural Resource Areas

Skiffes Creek and the James River has been used for shipping for many years. None of the resources listed as worthy of special consideration will be disturbed by this project.

b. Coastal Natural Hazard Areas

The project will not affect any Highly Erodible Areas or Coastal High Hazard Areas.

c. Waterfront Development Areas

The area where dredging and dredge material disposal will occur is not designated as a Waterfront Development Area. However, the area provides access to ports, and keeping those ports operational is in accordance with the intent of this advisory policy.

h. Underwater Historic Sites [I wasn't sure where this one belonged; pasted (after alteration) from the other document.]

There are no underwater historic sites within the project area. The area has been dredged before and has been an active shipping channel for many years.

Advisory Policies for Shorefront Access Planning and Protection

No public beaches, commercial waterfront, recreation areas, wildlife management areas, or parks are located in the project area. Historic properties and cultural resources near the dredging sites and FEDMMA are addressed in the EA.

a. Virginia Public Beaches

There are no public beaches in the project area.

b. Virginia Outdoors Plan

No public access point exists near the project site. The installation is guarded 24 hours per day.

c. Parks, Natural Areas, and Wildlife Management Areas

There are no parks, natural areas or wildlife management areas near the project site.

d. Waterfront Recreational Land Acquisition

No land disposal will occur in conjunction with the proposed project.

e. Waterfront Recreational Facilities

No recreational facilities are involved in the proposed project.

f. Waterfront Historic Properties

There are no standing structures or archaeological sites within the project area nor are there any historic structures within the viewsheds that would be affected by the proposed action.

Based on our review of Virginia's rules of coastal zone management, we have determined that the proposed action is consistent with the long-term goals and policies of the VCRMP. We request your concurrence with this determination as soon as possible.

Should you have any questions, please contact me at (757) 441-7767 or richard.j.muller@usace.army.mil. Thank you for your assistance in this matter.

Sincerely,

Richard J. Muller

Appendix E

Bird Species at Fort Eustis

Table E
Bird Species Recorded on Fort Eustis, 1990—1991

Scientific Name	Common Name
Gavia immer	common loon
Podiceps grisegena	red-necked grebe
Podiceps auritus	horned grebe
*Podilymbus podiceps**	pied-billed grebe
*Phalacrocorax auritus**	double-crested cormorant
Ardea herodias	great blue heron
*Ardea alba**	great egret
*Egretta thula**	snowy egret
Butorides striatus	green heron
Bubulcus ibis	cattle egret
*Nycticorax violaceus**	yellow-crowned night-heron
*Botaurus lentiginosus**	American bittern
*Ixobrychus exilis**	least bittern
Cygnus olor	mute swan
Cygnus columbianus	tundra swan
Branta canadensis	Canada goose
Aix sponsa	wood duck
Anas crecca	green-winged teal
Anas rubripes	American black duck
Anas platyrhynchos	mallard
*Anas strepera**	gadwall
Anas acuta	northern pintail
*Anas discolor**	blue-winged teal
Anas clypeata	northern shoveler
Anas americana	American wigeon
Aythya affinis	lesser scaup
Aythya marila	greater scaup
Aythya collaris	ring-necked duck
Aythya americana	redhead
Aythya valisineria	canvasback
Bucephala albeola	bufflehead
Bucephala clangula	common goldeneye
Clangula hyemalis	oldsquaw
Lophodytes cucullatus	hooded merganser
Mergus serrator	red-breasted merganser
Oxyura jamaicensis	ruddy duck

Table E
Bird Species Recorded on Fort Eustis, 1990—1991 (continued)

Scientific Name	Common Name
Accipiter striatus	sharp-skinned hawk
*Accipiter cooperii**	Cooper's hawk
*Haliaeetus leucocephalus**	bald eagle
Pandion haliaetus	osprey
Buteo lineatus	red-shouldered hawk
Buteo jamaicensis	red-tailed hawk
Falco sparverius	American kestrel
Falco columbarius	merlin
Colinus virginianus	northern bobwhite
*Gallinula chloropus**	common moorhen
*Rallus elegans**	king rail
Rallus longirostris	clapper rail
*Rallus limicola**	Virginia rail
*Porzana carolina**	sora
Charadrius vociferus	killdeer
Charadrius semipalmatus	semipalmated plover
Tringa melanoleuca	greater yellowlegs
Tringa flavipes	lesser yellowlegs
Tringa solitaria	solitary sandpiper
*Actitis macularia**	spotted sandpiper
Arenaria interpres	ruddy turnstone
Calidris alba	sanderling
Calidris alpina	dunlin
Calidris fuscicollis	white-rumped sandpiper
Calidris minutilla	least sandpiper
Calidris pusilla	semipalmated sandpiper
Calidiris mauri	western sandpiper
Calidiris melanotos	pectoral sandpiper
Calidris himantopus	stilt sandpiper
Limnodromus griseus	short-billed dowitcher
Limnodromus scolopaceus	long-billed dowitcher
Gallinago gallinago	common snipe
Scolopax minor	American woodcock
Phalaropus tricolor	Wilson's phalarope
Larus philadelphia	Bonaparte's gull
Larus atricilla	laughing gull

Table E
Bird Species Recorded on Fort Eustis, 1990—1991 (continued)

Scientific Name	Common Name
Larus delawarensis	ring-billed gull
Larus argentatus	herring gull
Larus fuscus	lesser black-backed gull
Larus marinus	great black-backed gull
*Sterna caspia**	Caspian tern
Sterna forsteri	Forster's tern
*Sterna maxima**	royal tern
Sterna hirundo	common tern
Chlidonias niger	black tern
Coccyzus americanus	yellow-billed cuckoo
Bubo virginianus	great horned owl
Strix varia	barred owl
Chaetura pelagica	chimney swift
Archilochus colubris	ruby-throated hummingbird
Ceryle alcyon	belted kingfisher
*Sphyrapicus varius**	yellow-bellied sapsucker
Colaptes auratus	northern flicker
Melanerpes erythrocephalus	red-headed woodpecker
Picoides villosus	hairy woodpecker
Dryocopus pileatus	pileated woodpecker
Myiarchus crinitus	great crested flycatcher
Sayornis phoebe	eastern phoebe
Tyrannus tyrannus	eastern kingbird
Progne subis	purple martin
Stelgidopteryx serripennis	northern rough-winged swallow
Riparia riparia	bank swallow
Hirundo rustica	barn swallow
Tachycineta bicolor	tree swallow
Sitta pygmaea	brown-headed nuthatch
*Sitta canadensis**	red-breasted nuthatch
*Certhia americana**	brown creeper
*Troglodytes troglodytes**	winter wren
Troglodytes aedon	house wren
*Cistothorus platensis**	sedge wren
Cistothorus palustris	marsh wren
Regulus calendula	ruby-crowned kinglet

Table E
Bird Species Recorded on Fort Eustis, 1990—1991 (continued)

Scientific Name	Common Name
Polioptila caerulea	blue-gray gnatcatcher
Sialia sialis	eastern bluebird
*Catharus guttatus**	hermit thrush
Dumetella carolinensis	gray catbird
Toxostoma rufum	brown thrasher
Bombycilla cedrorum	cedar waxwing
Vireo solitarius	solitary vireo
Vireo olivaceus	red-eyed vireo
Vireo griseus	white-eyed vireo
Protonotaria citrea	prothonotary warbler
Vermivora celata	orange-crowned warbler
Parula americana	northern parula
Dendroica petechia	yellow warbler
Dendroica dominica	yellow-throated warbler
*Dendroica magnolia**	magnolia warbler
Dendroica coronata	yellow-rumped warbler
Dendroica caerulescens	black-throated blue warbler
Dendroica striata	blackpoll warbler
Dendroica palmarum	palm warbler
Dendroica discolor	prairie warbler
Dendroica pinus	pine warbler
Mniotilta varia	black-and-white warbler
Setophaga ruticilla	American redstart
Seiurus noveboracensis	northern waterthrush
Seiurus aurocapillus	ovenbird
Geothlypis trichas	common yellowthroat
Icteria virens	yellow-breasted chat
Piranga olivacea	scarlet tanager
Pheucticus ludovicianus	rose-breasted grosbeak
Guiraca caerulea	blue grosbeak
Passerina cyanea	indigo bunting
Pipilo erythrophthalmus	eastern towhee
Spizella passerina	chipping sparrow
Pooecetes gramineus	vesper sparrow
Ammodramus leconteii	LeConte's sparrow
Passerculus sandwichensis	savannah sparrow

Table E
Bird Species Recorded on Fort Eustis, 1990—1991 (continued)

Scientific Name	Common Name
*Melospiza georgiana**	swamp sparrow
Passerella iliaca	fox sparrow
Junco hyemalis	dark-eyed junco
Euphagus carolinus	rusty blackbird
Icterus galbula	Baltimore oriole
Icterus spurius	orchard oriole
*Carpodacus purpureus**	purple finch
Carduelis pinus	pine siskin

*Listed on the Virginia rare animal list.

Appendix F

Fish Species at Fort Eustis

Table F
Fish Species at Fort Eustis

Name	**Location**	
	James River	**Eustis Lake**
American eel (*Anguilla rostrata*)	!	
Atlantic thread herring (*Opisthonema oglinum*)	!	
Atlantic croaker (*Micropogonias undulatus*)	!	
Atlantic silverside (*Menidia menidia*)	!	
Bay anchovy (*Anchoa mitchilli*)	!	
Black crappie (*Pomoxis nigromaculatus*)		!
Blackcheek tonguefish (*Symphurus plagiusa*)	!	
Bluefish (*Pomatomus saltatrix*)	!	
Bluegill (*Lepomis macrochives*)		!
Bowfin (*Amia calva*)		!
Brown bullhead (*Ameiurus nebulosus*)		!
Channel catfish (*Ictalurus punctatus*)		!
Common carp (*Cyprinus carpio*)	!	!
Golden shiner (*Notemigonus crysoleucas*)		!
Gizzard shad (*Dorosoma cepedianum*)	!	!
Hogchoker (*Trinectes maculatus*)	!	
Inshore lizardfish (*Synodus foetens*)	!	
Largemouth bass (*Micropterus salmoides*)		!
Mosquitofish (*Gambusia affinis*)		!
Northern kingfish (*Menticirrhus saxatillis*)	!	
Pumpkinseed (*Lepomis gibbosus*)		!
Red ear sunfish (*Lepomis microlophus*)		!
Rough silverside (*Membras martinica*)	!	
Spot (*Leiostomus xanthurus*)	!	
Striped anchovy (*Anchoa hepsetus*)	!	
Striped killifish (*Fundulus majalis*)	!	

Table F
Fish Species at Fort Eustis (continued)

Name	**Location**	
	James River	**Eustis Lake**
Striped bass (*Morone saxatillis*)	**!**	**!**
Weakfish (*Cynoscion regalsi*)	**!**	
White catfish (*Ictalurcis catus*)		**!**
White crappie (*Pomoxis annularis*)		**!**
White mullet (*Mugil curema*)	**!**	
White perch (*Morone americana*)	**!**	**!**
Yellow Bullhead (*Ameiurus natalis*)		**!**

Source: IS&T, 1990b, and USATCFE, 1981d, cited in SAIC, 1996.

Appendix G

Essential Fish Habitat (EFH) Assessment

Essential Fish Habitat Assessment for
Dredging of Skiffes Creek and the MARAD Facility Channel,
Newport News, Virginia
December 23, 2002

Description of the Proposed Action

The U.S. Army Transportation Center, Fort Eustis, and the U.S. Army Corps of Engineers, Norfolk District, are preparing an Environmental Assessment to evaluate potential environmental effects associated with the proposed dredging of two unconnected but neighboring navigation channels accessing facilities on the eastern shoreline of the James River, Virginia, and to vertically expand the Fort Eustis Dredged Material Management Area (FEDMMA) on Fort Eustis, Virginia.

The Army and the U.S. Maritime Administration (MARAD) propose to dredge the Skiffes Creek Channel to an average depth of –16 feet MLLW (-11 feet MLLW to –17 feet MLLW) for a length of 8,300 feet from deep water in the James River into Skiffes Creek. This would include two turning basins, variable in width and 1,600 and 1,440 feet in length, with a depth of –15 MLLW. The estimated amount of dredged material is 500,000 cubic yards. The MARAD Facility Access Channel would be dredged to a depth of –14 feet MLLW for a length of 2,800 feet, running perpendicular to the James River Channel and terminating upstream at an included turning basin 1,000 feet in length with a variable width, no greater than approximately 420 feet. The estimated amount of dredged material is 180,000 cubic yards. The dredged material from both channels would be hydraulically pumped through a 16” pipeline varying in length depending on the distance to the FEDMMA, which is situated on land. The pipeline would run (supported by floatation devices) over water to the shoreline, then cross one road and adjacent wetlands, and into the FEDMMA.

The FEDMMA would be vertically expanded by raising the dike walls to a minimum height of 30 feet by using the dried dredged material inside the FEDMMA from previous dredging as the source material for the dike raising. The outside footprint of the FEDMMA would remain unchanged. Dredged material placed in the FEDMMA, would be allowed to settle and excess water decanted over an outlet box that drains into Milstead Island Creek.

Pursuant to requirements of the National Environmental Policy Act, the EA addresses dredging proposed to be implemented as part of this action. Because the project is located in Essential Fish Habitat (EFH) for nine federally managed fish species in the James River Estuary, consultation with the National Marine Fisheries Service is mandated under the Magnuson-Stevens Fishery Conservation and Management Act.

Essential Fish Habitat Designations

Nine fish species have essential fish habitat designations in the James River estuary. The species and their life stages are listed in Table 1 below.

Table 1.
Essential Fish Habitat Designations for the James River Estuary

Species	**Eggs**	**Larvae**	**Juveniles**	**Adults**	**Spawning Adults**
Windowpane flounder (*Scopthalmus aquosus*)			M	M	
Bluefish (*Pomatomus saltatrix*)			M	M	
Atlantic butterfish (*Peprilus triacanthus*)			M	M	
Summer flounder (*Paralicthys dentatus*)		M	M	M	
Black sea bass (*Centropristus striata*)			M	M	
King mackerel (*Scomberomorus cavalla*)	X	X	X	X	
Spanish mackerel (*Scomberomorus maculatus*)	X	X	X	X	
Cobia (*Rachycentron canadum*)	X	X	X	X	
Red drum (*Sciaenops occelatus*)	X	X	X	X	

M = The EFH designation for this species includes the mixing water/ brackish salinity zone of this bay or estuary (0.5% < salinity < 25.0%).
X = EFH has been designated within the square for a given species and life stage.
Source: NMFS, 2002.

Windowpane flounder

Juveniles: Essential Fish Habitat (EFH) is bottom habitat with a substrate of mud or fine-grained sand; water temperatures below 25° C; depths from 1 to 100 meters; and salinities between 5.5 to 36 percent. Adults: Bottom habitats with a substrate of mud or fine-grained sand; water

temperatures below 26.8° C; depths from 1 to 75 meters; and salinities between 5.5 to 36 percent (NMFS, 2002).

Bluefish

Juveniles: Inshore, EFH is all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida. Generally juvenile bluefish occur in Mid-Atlantic estuaries from May through October in the mixing and seawater zones. Adults: Inshore, EFH is all major estuaries on the U.S. Atlantic coast, including the James River. Adult bluefish are found in Mid-Atlantic estuaries from April through October, in the mixing and seawater zones. Bluefish adults are highly migratory and distribution varies seasonally and according to the size of the individuals comprising the schools (NMFS, 2002).

Atlantic Butterfish

Juveniles and Adults: Inshore, EFH is the mixing and/or seawater portions of all the estuaries where juvenile butterfish are "common" to "highly abundant" on the Atlantic coast, including the James River, Virginia. Generally, juvenile butterfish are found at depths between 33 feet and 1200 feet and temperatures between 37° F and 82° F (NMFS, 2002).

Summer Flounder

Larvae: Inshore EFH is all the estuaries where summer flounder were identified as being present in salinity zones greater than 0.5 ppt. In general, summer flounder larvae are most abundant nearshore (12 to 50 miles from shore) at depths between 30 to 230 feet. Juveniles: Inshore EFH is all of the estuaries where summer flounder were identified as being in salinity zones greater than 0.5 ppt. In general, juveniles use several estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, and open bay areas in water temperatures greater than 37 ^{o}F and salinities from 10 to 30 ppt range. Adults: Inshore, EFH is the estuaries where summer flounder were identified as being common, abundant, or highly abundant in the Estuarine Living Marine Resources (ELMR) database in salinity zones greater than 0.5 ppt. Generally summer flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer Continental Shelf at depths of 500 ft in colder months. The specific designation of Habitat Areas of Particular Concern (HAPC) for summer flounder is as follows: “All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH is HAPC. If native species of submerged aquatic vegetation are eliminated then exotic species should be protected

because of functional value, however, all efforts should be made to restore native species" (NMFS, 2002).

Black Sea Bass

Juveniles: Inshore, EFH is the estuaries where black sea bass are identified as being common, abundant, or highly abundant in the ELMR database in salinity zones greater than 0.5 ppt. Juveniles are found in the estuaries in the summer and spring. "Generally, juvenile black sea bass are found in waters warmer than 43° F with salinities greater than 18 ppt and coastal areas between Virginia and Massachusetts, but winter offshore from New Jersey and south. Juvenile black sea bass are usually found in association with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas; offshore clam beds and shell patches may also be used during the wintering." Adults: Inshore, EFH is the estuaries where adult black sea bass were identified as being common, abundant, or highly abundant in the ELMR database for salinity zones greater than 0.5 ppt. Black sea bass are generally found in estuaries from May through October. Wintering adults are generally offshore, south of New York to North Carolina. Temperatures above 43° F seem to be the minimum requirements. Structured habitats (natural and man-made), sand and shell are usually the substrate preference (NMFS, 2002).

King Mackerel, Spanish Mackerel, Cobia

Essential fish habitat for these three coastal migratory pelagic species includes all coastal inlets and all state-designated nursery habitats of particular importance to coastal migratory pelagics. For cobia, essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat (NMFS, 2002).

Red Drum

Essential Fish Habitat for Red Drum includes all of the following habitats to a depth of 50 meters offshore: tidal freshwater; estuarine emergent vegetated wetlands (flooded saltmarshes, brackish marsh, tidal creeks); submerged rooted vascular plants (sea grasses); oyster reefs and shell banks; unconsolidated bottom (soft sediments); and artificial reefs. The area includes the James River in Virginia. HAPC for red drum includes all coastal inlets, all state-designated nursery habitats of particular importance to red drum; other identified spawning areas in the future; and habitats identified for submerged aquatic vegetation. Seagrass beds or SAV prevalent in the Chesapeake Bay are critical areas for 1 and 2 year old red drum. "Seagrass beds, shallow areas of estuarine rivers and mainland shorelines, are where many red drum reside during the summer. The various

inlets, adjoining channels, sounds, and outer bars of ocean inlets are critical areas for spawning activity as well as feeding and daily movements and may be affected by constant dredging, jettying or excessive boat traffic. Adult red drum spend a lot of time in these areas during spring and fall with large concentrations located near the least trafficked inlets"(NMFS, 2002).

Kepone and Dredging

The chlorinated hydrocarbon pesticide Kepone (chlordecone) was introduced into the James River at Hopewell, Virginia for several years prior to 1975 when releases stopped and the James River was closed to all forms of fishing (Loesch, et al., 1982). Fishing bans have since been lifted, but researchers have been concerned about the effects of dredging on re-suspending Kepone-contaminated sediments into the water column. Aquatic organisms can ingest Kepone either through exposure to contaminated water or by eating contaminated food (Lunsford, et al., 1987). Filter feeders low on the food chain like clams are most likely to absorb Kepone from concentrations dissolved in the water column.

Scientific studies on the effects of Kepone and dredging on the 9 fish species with EFH in the James River are not available. However, in a study by Lunsford and others (1987), uptake of Kepone by wedge clams (*Rangia cuneata*) was monitored during dredging in the James River estuary in autumn 1981. After two weeks of dredging, wedge clams downstream of the dredging were observed with a 0.01 µg/g to 0.04 µg/g increase in tissue contamination with Kepone (Lunsford, et al., 1987). In 1987, shellfish in the James River estuary had Kepone contamination levels below the Food and Drug Administration (FDA) action level of 0.3 µg/g. An increase in Kepone contamination of 0.01 µg/g to 0.04 µg/g would not be expected push most organisms past the FDA action level (Lunsford, et al., 1987).

Kepone levels in the James River estuary water column are generally highest from July to September, which is thought to be associated with high concentrations of phytoplankton during that period (Lunsford and Blem, 1982). Wedge clams monitored from September 1978 to August 1979 had maximum Kepone tissue concentrations in late autumn or early winter, and lowest concentrations in spring (Lunsford and Blem, 1982). Wedge clams appear to concentrate Kepone in their bodies during the summer. Dredging activities in the spring and summer could contribute to the increased uptake of Kepone by bivalves by putting extra Kepone into the water column at the time when bivalves are most likely to absorb it (Lunsford and Blem, 1982).

Roberts and Bendl (1982) studied the acute toxicity of Kepone in the water column to three species of fish. American eel (*Anguilla rostrata*), bluegill (*Lepomis macrochirus*), and channel catfish (*Ictalurus punctatus*) were exposed to Kepone in water under laboratory conditions to determine their 96 hour LC50, which is the concentration of Kepone at which 50 percent of the fish die after being exposed for 96 hours. Results indicate the 96 hour LC50s for American eel in the elvers stage, bluegill and channel catfish, were 35 µg/L, 30 to 66 µg/L, and 512 µ/L, respectively. Researchers also determined the maximum acceptable toxicant concentration (MATC), which is "the maximum concentration of a compound which can occur dissolved in water without causing long-term effects for various species" (Roberts and Bendl, 1982). The MATCs for American eel, bluegill and channel catfish were 0.14 µg/L, 0.20 µg/L, and 2 µg/L, respectively. A reported literature value for ambient Kepone concentrations in the James River near Skiffes Creek was 5 µg/L, which was 2 to 3 orders of magnitude lower than the MATCs above (Slone and Bender, 1980, cited in Roberts and Bendl, 1982). One interesting note is that, "freshwater fishes appear more tolerant to Kepone than marine fishes" (Roberts and Bendl, 1982).

Blue crabs and anadromous fishes can absorb Kepone by eating Kepone-contaminated food (Fisher, et al., 1983; Lunsford, et al., 1987). In a study by Fisher and others (1983), juvenile blue crabs were fed food contaminated with Kepone at different levels within the range observed in the James River (<0.02 µg/g to 2.5 µg/g). Crab mortality was no different for the Kepone treatments versus the Kepone-free controls, therefore the authors concluded that food uptake of Kepone at levels found in the environment was not a problem for blue crabs (Fisher, et al., 1983). Other laboratory experiments performed on estuarine fish observed no lethal or sub-lethal behavioral effects on fish exposed to Kepone-contaminated water until the fish were exposed to Kepone at concentrations several orders of magnitude higher than normal conditions in the James River (Roberts and Bendl, 1982). This finding is consistent with the observation that in the 1970's there were no large Kepone-related fish kills in portions of the river that received Kepone effluent (Roberts and Bendl, 1982).

In 1987, Fort Eustis commissioned a study to identify toxic chemicals and metals in sediment cores taken from dredge and disposal sites in the vicinity of the main pier at the Third Port (Environmental Testing Services, 1987). Most of the chemicals and metals tested, including PCBs, were below detection limits for most of the samples. All sediment cores analyzed had Kepone concentrations below the detection limit of 0.015 µg/g.

In April 2002, Fort Eustis conducted another sediment sampling study to identify metals, pesticides, and mercury beneath the main pier at Third Port as part of an Environmental Assessment for pier removal, replacement, and dredging. Arsenic was the only substance found at levels above the Environmental Protection Agency Region 3 Risk-Based Concentration (RBC) of 3.82 mg/kg. Arsenic concentrations of 5.1 to 7.1 mg/kg were observed. However, this level was within the mean soil background range of 0.1 to 40 mg/kg. Kepone was not detected in sediment samples in April 2002 (IMS Environmental Services, 2002).

Because the MARAD Facility Access Channel has not been dredged since 1968, in November 2002 the U.S. Army Corps of Engineers, Norfolk District tested the sediment that would be dredged from this channel Results of this testing will be included when available.

[Insert MARAD sampling results here]

Environmental Consequences

Short-term minor adverse effects on essential fish habitat would be expected from dredging approximately 500,000 cubic yards of sediment to deepen the Skiffes Creek Channel and 180,000 cubic yards of sediment to deepen the MARAD Facility Access Channel. Hydraulic dredging techniques with disposal on land would be expected to suspend only a minor amount of sediment in the water column, which could have minor adverse effects on fish eggs and larvae. Because slight increases in Kepone contamination in wedge clams were observed after dredging in the James River in 1981, slight increases in Kepone contamination of fish and shellfish could be possible after dredging for this project. However, during dredging activities aquatic organisms near the dredged channels would not be expected to absorb enough Kepone to exceed the FDA action limit for safe consumption. Recent sediment sampling at the mouth of Skiffes Creek found no detectable levels of kepone. As an additional precaution, sediment in the MARAD was sampled for toxic chemicals, including Kepone, before dredging for this project. Furthermore, fish and bivalves have been observed to naturally rid their bodies of (depurate) Kepone over time (Roberts and Bendl, 1982; Lunsford et al, 1987). However, blue crabs depurate Kepone very slowly (Fisher, et al. 1983).

Overall, short-term minor adverse effects would be expected to fish species with EFH designations in the James River Estuary because time-of-year restrictions on dredging would be

expected to protect fish during spring migration and spawning. The Virginia Department of Game and Inland Fisheries is expected to recommend that no dredging occur in the James River from 15 February to 30 June to protect anadromous fish. No impacts to wetlands, submerged aquatic vegetation, natural reefs, wrecks, water flow, salinity or temperature would be expected from dredging the Skiffes Creek and MARAD Access Channels.

Cumulative Effects

Effects of dredging on EFH would be expected to be minor and short-lived. One study of the effects of dredging Kepone-contaminated sediments have shown only small (0.01 µg/g to 0.04 µg/g) increases in Kepone concentrations in clams. Kepone bioaccumulation would not be expected from dredging because fish and bivalves have been observed to depurate Kepone over time. Dredged sediment will be disposed on land, reducing the prevalence of potentially contaminated sediments in James River aquatic environments.

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Appendix H

Record of Non-Applicability (RONA) and Air Quality Model

RECORD OF NON-APPLICABILITY CONCERNING THE GENERAL CONFORMITY RULE (Code of Federal Regulations (CFR), Title 40 Part 51)

Fort Eustis, Virginia, was established in 1918 on 9,000 acres along the James River. Following creation of the Transportation Corps in 1942, in 1950 Fort Eustis became the U.S. Army Transportation Center and Fort Eustis. The installation today is the home of the U.S. Army Transportation Corps.

The Army proposes to dredge Skiffes Creek to allow all necessary ships access to the Third Port Facility. Dredging operations include the dredging of Skiffes Creek, the construction effort to expand the disposal site berm, and disposal of the dredged material. This construction activity would induce short-term minor effects on local air quality. Fort Eustis is located in a maintenance area for ozone and is in attainment for all other criteria pollutants.

Conformity under the Clean Air Act, Section 176, has been evaluated for the proposed action in accordance with 40 CFR Part 51. The requirements of this rule are not applicable to this action because the total direct and indirect emissions associated with the proposed action would be below the *de minimis* threshold. Estimated direct and indirect emissions for year with the greatest intensity of work are described in Table 1. All emissions would fall well below the *de minimis* threshold established at 40 CFR 51.853(b) of 100 tons per year for volatile organic compounds (VOCs) and 100 tons per year for nitrogen oxides (NO_x). Therefore, the project/action is not considered regionally significant under 40 CFR 51.853(i).

Table 1
***De minimis* Levels for Criteria Pollutants in the Newport News-Virginia Beach-Norfolk Metropolitan Statistical Area, and Estimated Emissions of the Proposed Project**

Criteria Pollutant	*De Minimis* Level (tons/Year)	Estimated Emissions (tons/year)
VOC	100	0.194
NO_x	100	3.019
CO	*	1.261
PM-10	*	0.214
SO_2	*	0.296

Source: Tetra Tech, Inc. 2002.
Note: ***** - Not a maintenance area for these pollutants.

_____ _____

Stephen A. McCall
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US Army Transportation Center
Fort Eustis, Virginia

Date

Scenario Details

Scenario Name: Skiffs Creek
Scenario Notes:

Analysis Tree:

- Skiffs Creek (Branch #1)
  - Bulldozer (Branch #2)
    - Weekly Use (Branch #3)
  - Trucks (Branch #4)
    - Weekly Use (Branch #5)
  - Dredging Equipment (Branch #6)
    - Weekly Use (Branch #7)

Branch Details:

Branch #1
- Branch Name: Skiffs Creek
  - Values:
    - Inputs:
    - Constants:
    - References:
    - Equations:
      - Reactive Organics = 0.194 tons
      - Nitrogen Oxide = 3.019 tons
      - Carbon Monoxide = 1.261 tons
      - Sulfur Oxides = 0.296 tons
      - Particulate Matter = 0.214 tons
  - Equations:
    - Reactive Organics: @SumSubAnalyses({Reactive Organics})
    - Nitrogen Oxide: @SumSubAnalyses({Nitrogen Oxide})
    - Carbon Monoxide: @SumSubAnalyses({Carbon Monoxide})
    - Sulfur Oxides: @SumSubAnalyses({Sulfur Oxides})
    - Particulate Matter: @SumSubAnalyses({Particulate Matter})

Branch #2
- Branch Name: Bulldozer
  - Values:
    - Inputs:
      - Equipment Type = Tracked Dozer
    - Constants:
    - References:
    - Equations:
      - Carbon Monoxide = 0.27 tons
      - Nitrogen Oxide = 0.677 tons
      - Particulate Matter = 0.056 tons
      - Reactive Organics = 0.06 tons

Sulfur Oxides = 0.057 tons
Equations:
Carbon Monoxide: @SumSubAnalyses({Carbon Monoxide})
Nitrogen Oxide: @SumSubAnalyses({Nitrogen Oxide})
Particulate Matter: @SumSubAnalyses({Particulate Matter})
Reactive Organics: @SumSubAnalyses({Reactive Organics})
Sulfur Oxides: @SumSubAnalyses({Sulfur Oxides})

Branch #3
Branch Name: Weekly Use
Values:
Inputs:
Active Weeks per Year = 40.0
Equipment Type = Tracked Dozer
Number of Units = 1.0
Hours per Active Week = 20.0 hours
Constants:
Modal Emission - CO = 306.37 gm/hr
Modal Emission - PM10 = 63.2 gm/hr
Modal Emission - ROG = 67.672 gm/hr
Modal Emission - SOx = 64.7 gm/hr
Modal Emission - NOx = 767.3 gm/hr
References:
Equations:
Carbon Monoxide = 0.27 tons
Nitrogen Oxide = 0.677 tons
Particulate Matter = 0.056 tons
Reactive Organics = 0.06 tons
Sulfur Oxides = 0.057 tons
Annual Hours of Use = 800.0 Hours
Equations:
Carbon Monoxide: {Annual Hours of Use}*{Modal Emission - CO}/(2000*453.5923745)
Nitrogen Oxide: {Annual Hours of Use}*{Modal Emission - NOx}/(2000*453.5923745)
Particulate Matter: {Annual Hours of Use}*{Modal Emission - PM10}/(2000*453.5923745)
Reactive Organics: {Annual Hours of Use}*{Modal Emission - ROG}/(2000*453.5923745)
Sulfur Oxides: {Annual Hours of Use}*{Modal Emission - SOx}/(2000*453.5923745)
Annual Hours of Use: {Number of Units}*{Hours per Active Week}*{Active Weeks per Year}

Branch #4
Branch Name: Trucks
Values:
Inputs:
Equipment Type = Off-highway Truck
Constants:
References:

Equations:
Carbon Monoxide = 0.72 tons
Nitrogen Oxide = 1.666 tons
Particulate Matter = 0.102 tons
Reactive Organics = 0.075 tons
Sulfur Oxides = 0.182 tons
Equations:
Carbon Monoxide: @SumSubAnalyses({Carbon Monoxide})
Nitrogen Oxide: @SumSubAnalyses({Nitrogen Oxide})
Particulate Matter: @SumSubAnalyses({Particulate Matter})
Reactive Organics: @SumSubAnalyses({Reactive Organics})
Sulfur Oxides: @SumSubAnalyses({Sulfur Oxides})

Branch #5
Branch Name: Weekly Use
Values:
Inputs:
Active Weeks per Year = 40.0
Equipment Type = Off-highway Truck
Number of Units = 1.0
Hours per Active Week = 20.0 hours
Constants:
Modal Emission - CO = 816.81 gm/hr
Modal Emission - PM10 = 116.0 gm/hr
Modal Emission - ROG = 84.738 gm/hr
Modal Emission - SOx = 206.0 gm/hr
Modal Emission - NOx = 1,889.16 gm/hr
References:
Equations:
Carbon Monoxide = 0.72 tons
Nitrogen Oxide = 1.666 tons
Particulate Matter = 0.102 tons
Reactive Organics = 0.075 tons
Sulfur Oxides = 0.182 tons
Annual Hours of Use = 800.0 Hours
Equations:
Carbon Monoxide: {Annual Hours of Use}*{Modal Emission - CO}/(2000*453.5923745)
Nitrogen Oxide: {Annual Hours of Use}*{Modal Emission - NOx}/(2000*453.5923745)
Particulate Matter: {Annual Hours of Use}*{Modal Emission - PM10}/(2000*453.5923745)
Reactive Organics: {Annual Hours of Use}*{Modal Emission - ROG}/(2000*453.5923745)
Sulfur Oxides: {Annual Hours of Use}*{Modal Emission - SOx}/(2000*453.5923745)
Annual Hours of Use: {Number of Units}*{Hours per Active Week}*{Active Weeks per Year}

Branch #6

Branch Name: Dredging Equipment
Values:
Inputs:
Equipment Type = Other Miscellaneous Equipment
Constants:
References:
Equations:
Carbon Monoxide = 0.27 tons
Nitrogen Oxide = 0.677 tons
Particulate Matter = 0.056 tons
Reactive Organics = 0.06 tons
Sulfur Oxides = 0.057 tons
Equations:
Carbon Monoxide: @SumSubAnalyses({Carbon Monoxide})
Nitrogen Oxide: @SumSubAnalyses({Nitrogen Oxide})
Particulate Matter: @SumSubAnalyses({Particulate Matter})
Reactive Organics: @SumSubAnalyses({Reactive Organics})
Sulfur Oxides: @SumSubAnalyses({Sulfur Oxides})

Branch #7
Branch Name: Weekly Use
Values:
Inputs:
Active Weeks per Year = 40.0
Equipment Type = Other Miscellaneous Equipment
Number of Units = 1.0
Hours per Active Week = 20.0 hours
Constants:
Modal Emission - CO = 306.37 gm/hr
Modal Emission - PM10 = 63.2 gm/hr
Modal Emission - ROG = 67.672 gm/hr
Modal Emission - SOx = 64.7 gm/hr
Modal Emission - NOx = 767.3 gm/hr
References:
Equations:
Carbon Monoxide = 0.27 tons
Nitrogen Oxide = 0.677 tons
Particulate Matter = 0.056 tons
Reactive Organics = 0.06 tons
Sulfur Oxides = 0.057 tons
Annual Hours of Use = 800.0 Hours
Equations:
Carbon Monoxide: {Annual Hours of Use}*{Modal Emission - CO}/(2000*453.5923745)
Nitrogen Oxide: {Annual Hours of Use}*{Modal Emission - NOx}/(2000*453.5923745)
Particulate Matter: {Annual Hours of Use}*{Modal Emission - PM10}/(2000*453.5923745)
Reactive Organics: {Annual Hours of Use}*{Modal Emission - ROG}/(2000*453.5923745)

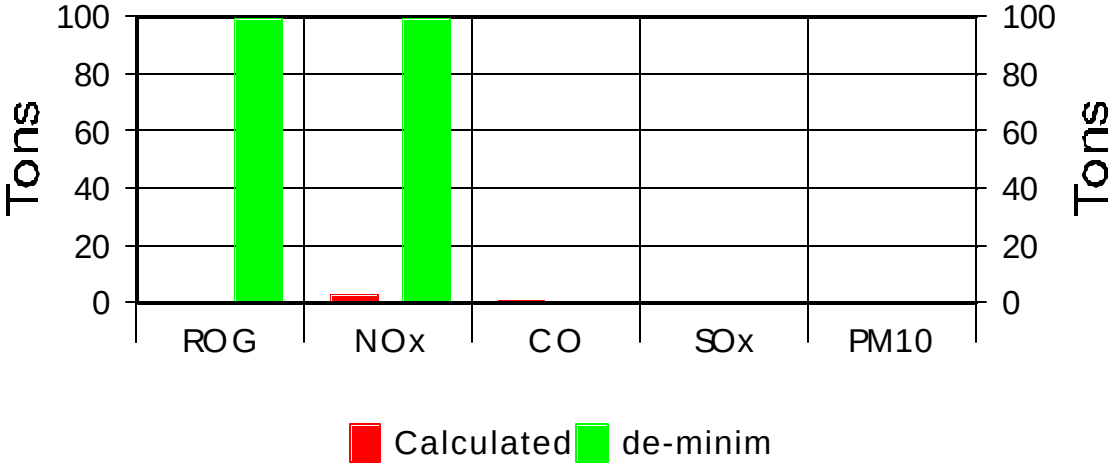
Sulfur Oxides: {Annual Hours of Use}*{Modal Emission - SOx}/(2000*453.5923745)
Annual Hours of Use: {Number of Units}*{Hours per Active Week}*{Active Weeks per Year}

Scenario Name: Skiffes Creek

Prepared By: Tetra Tech, Inc.
Prepared on: 11/14/2002
Last Updated on: 11/14/2002

Attainment Information:
State: Virginia
Attainment Zone: Norfolk, VA Beach, Newport News, VA Area

Chemical	Value (tons)	de-minimus
ROG	.194	100
NOx	3.019	100
CO	1.261	NA
SOx	.296	NA
PM10	.214	NA



Notes:

ACRONYMS AND ABBREVIATIONS

AR	Army Regulation
BMP's	Best management practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibels
DCR	Department of Conservation and Recreation
DNH	Division of Natural Heritage
EA	Environmental Assessment
EFH	Essential Fish Habitat
FDA	Food and Drug Administration
FEDMMA	Fort Eustis Dredged Material Management Area
FNSI	Finding of No Significant Impact
HM	hazardous materials
HW	hazardous waste
HWM SOP	Hazardous Waste Management Standing Operating Procedure
LOTS	Logistics over the shore
µg/g	micrograms per gram
MARAD	Maritime Administration
MLLW	Mean Low Low Water
m.s.l.	mean sea level
NEPA	National Environmental Policy Act
NOx	nitrogen oxides
NPL	National Priority List
NRHP	National Register of Historic Places
pH	hydrogen ion potential
PM-10	particulate matter smaller than 10 microns (i.e., inhalable particulate matter)
POL	Petroleum, oil, lubricant
ROI	Region of Influence
RONA	Record of Non-applicability
SHPO	State Historic Preservation Office
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VADEQ	Virginia Department of Environmental Quality
VCRMP	Virginia Coastal Resources Management Program
VDNH	Virginia Division of Natural Heritage
VOCs	volatile organic compounds