1/1/08-01359

Final

Construction Completion Report
Non-Time-Critical Removal Action
Site 7

Naval Amphibious Base Little Creek
Virginia Beach, Virginia

NAVFAC
Naval Facilities Engineering Command
NAVFAC ATLANTIC

Prepared for

Department of the Navy
Naval Facilities Engineering Command Atlantic

Contract No. N62470-03-D-4401
TO-0063

Prepared by

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

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Acronyms and Abbreviations

AHA	Activity Hazard nalysis
APP	Accident Prevention Plan
ASTM	American Society for Testing and Materials
BBLPS	Behavior-Based Loss Prevention System
BERA	Baseline Ecological Risk Assessment
BTEX	benzene, toluene, ethylbenzene, and xylene
CFR	Code of Federal Regulations
CQM	Construction Quality Management
E&S	erosion and sediment
EE/CA	Engineering Evaluation/Cost Analysis
ft	feet/foot
HASP	Health and Safety Plan
HPP	Hurricane Preparedness Plan
HSM	Health and Safety Manager
IRP	Installation Restoration Program
JV I	AGVIQ-CH2M HILL Joint Venture I
lf	linear feet
MIDLANT	Mid-Atlantic Division
NAB	Naval Amphibious Base
NAVFAC	Naval Facilities Engineering Command
NLI	Near Loss Investigation
NTCRA	Non-Time-Critical Removal Action
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PPE	personal protective equipment
PTSP	Pre-Task Safety Plan
QC	Quality Control
QCM	Quality Control Manager
RBC	risk-based concentration
ROICC	Resident Officer in Charge of Construction
SSO	site safety officer
SVOC	semivolatile organic compound
SWO	Safe Work Observations
T&D	transport and dispose

TO	Task Order
TPH	total petroleum hydrocarbon
USACE	United States Army Corp of Engineers
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VOC	volatile organic compound

SECTION 1

Introduction

This report has been prepared for the Resident Officer in Charge of Construction (ROICC) and the Naval Amphibious Base (NAB) Little Creek Installation Restoration Program (IRP) Partnering Team, which consists of representatives from NAB Little Creek, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Division (MIDLANT), United States Environmental Protection Agency (USEPA) Region III, and Virginia Department of Environmental Quality (VDEQ).

AGVIQ-CH2M HILL Joint Venture I (JV I) was contracted by the NAVFAC Atlantic Division to perform a non-time-critical removal action (NTCRA) at IRP Site 7, Amphibious Base Landfill, located at NAB Little Creek in Virginia Beach, Virginia. The NTCRA was completed in accordance with the Engineering Evaluation/Cost Analysis (EE/CA) for Site 7 (CH2M HILL, 2005a) and the final NTCRA Work Plan for Site 7 (JV I, 2006).

Site work was conducted by JV I from August 2006 through June 2007. This report provides a summary of the construction activities conducted and any variations from the original scope of work and engineering specifications. The report organization is as follows:

- **Section 1.** Introduction
- **Section 2.** Scope of Work
- **Section 3.** Summary of Action
- **Section 4.** Final Health and Safety Report
- **Section 5.** Final Quality Control (QC) report
- **Section 6.** Schedule and Material Summary
- **Section 7.** References

Relevant documentation of the NTCRA has been compiled in the following appendixes:

- **Appendix A.** Photograph Log
- **Appendix B.** Waste and Transportation and Disposal Records
- **Appendix C.** Borrow Source Analytical and Geotechnical Results
- **Appendix D.** Daily and Quality Control Reports
- **Appendix E.** Record Drawings

Note that **Appendixes B**, **C**, and **D** are provided in electronic form only. **Appendix A** is provided electronically with a selection of photographs provided in hard copy with captions.

1.1 Facility Description

NAB Little Creek is located in the northwest corner of Virginia Beach, Virginia (**Figure 1-1**). The area surrounding this 2,215-acre base is low lying and relatively flat with several fresh water bodies (Chubb Lake, Lake Bradford, Little Creek Reservoir/Lake Smith, and Lake Whitehurst) located on or adjacent to the base. NAB Little Creek centers around four saltwater bodies: Little Creek Harbor, Little Creek Cove, Desert Cove, and Little Creek Channel that connects the coves and harbor with the Chesapeake Bay.

NAB Little Creek is primarily an industrial facility that provides logistic facilities and support services for local commands, organizations, home ported ships, and other United States and allied units to meet the amphibious warfare training requirements of the Armed Forces of the United States. In addition to industrial land-use, NAB Little Creek is also used for recreational, commercial, and residential purposes. Specifically, the southeast corner of the base has been developed for residential use. Land development surrounding the base is residential, commercial, and industrial.

NAB Little Creek was commissioned on July 30, 1945, by combining four contiguous activities. The Navy began purchasing land in the area from private estates and the Pennsylvania Railroad just prior to World War II. The first activity to be commissioned was the Amphibious Training Base in the southwestern corner of the present base near Little Creek Harbor. The base's mission was the training of landing craft personnel for operational assignments. The second activity was the Construction Battalion Training Center which occupies most of the current acreage of the facility. The third and fourth activities were the U. S. Naval Section Base and the Armed Guard Training Center, respectively. Over the last 60 years, NAB Little Creek has expanded in both area and the complexity of its mission and has added new activities.

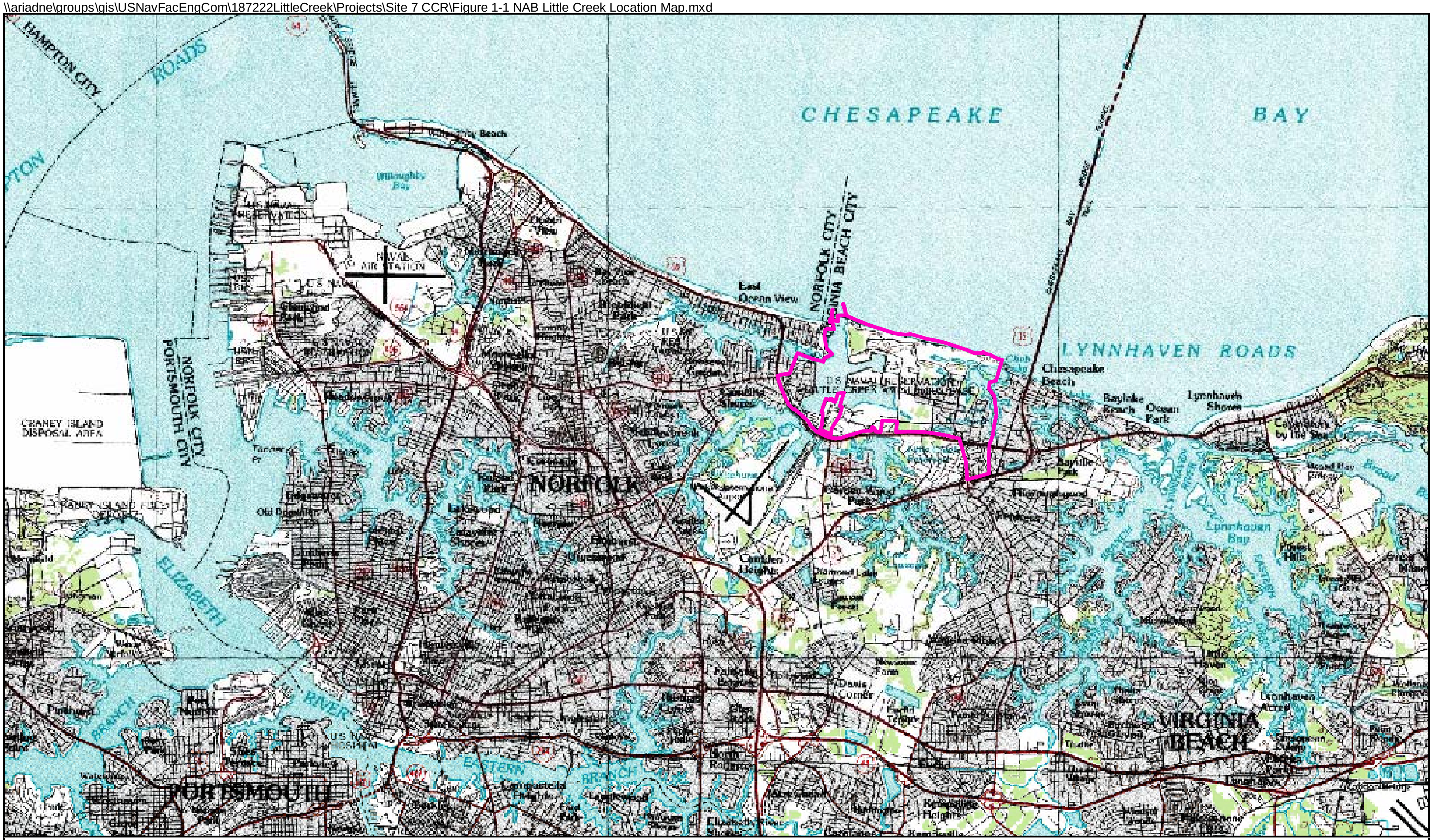
1.2 Site Description

Site 7, the Amphibious Base Landfill, is located in the south-central portion of the installation as shown on **Figure 1-2**. The landfill operated from 1962 to 1979. The landfill was initially operated as a trench type landfill with open burning of refuse in the trenches. The trenches were excavated to the depth at which groundwater filled the trench, cover was applied as necessary to maintain traction for the equipment involved in the operation. In 1994, the landfill was reportedly covered with approximately 24 inches of compacted soil and 2 to 3 inches of topsoil cover. A vegetative cover was also established to mitigate dermal contact with surface soils in 1994. Limited surface debris removal was conducted and a soil cover was placed over a portion of the site in 1998. There is no evidence of past hazardous waste disposal at the site. No release controls were in place at the site and no waste inventory is available.

The (CH2M HILL, 2004) Baseline Ecological Risk Assessment (BERA) indicated potential risks in wetland/aquatic habitats at Site 7 in the central portion of the drainage canal located in the western portion of the site (**Figure 1-3**). Risks were associated with copper, lead, Aroclor 1260, and five pesticides present in canal sediments. An EE/CA was completed for Site 7 in February 2005 to evaluate a NTRCA of these sediments (CH2M HILL, 2005a).

A debris delineation survey was conducted in July 2005 to evaluate the extent of shallow debris present at Site 7 (CH2M HILL, 2005b). Results of the field investigation indicated the area between the canal bank and western side of the landfill contained significant shallow debris, and the canal bank was potentially unstable in several areas. The results of the debris survey were documented in a technical memorandum, which recommended improvement of the soil cover through placement of additional clean fill over areas of the site and extend the soil cover to include the east side of the western canal bank as part of future soil maintenance activities. The extension of the soil cover to the canal bank was completed in conjunction with the NTCRA to mitigate potential ecological risk associated with canal sediment. Additional soil cover maintenance activities recommended in the November 2005 technical memorandum will be conducted at a future date under a separate contract.

\\ariadne\groups\gis\USNavFacEngCom\187222LittleCreek\Projects\Site 7 CCR\Figure 1-1 NAB Little Creek Location Map.mxd



Legend

Activity Boundary

N
W E
S

0 5,000 10,000 20,000
Feet

Figure 1-1
NAB Little Creek Location Map
Site 7 Non-Time-Critical Removal Action
Construction Completion Report
Naval Amphibious Base Little Creek
Virginia Beach, Virginia

AGVIQ
CH2M HILL

\\ariadne\groups\gis\USNavFaceNGCom\LittleCreek\Projects\Figure 1-2 Site Location Map.mxd

Legend

Activity Boundary at NAB Little Creek

N
W E
S

0 375 750 1,500 2,250
Feet

Figure 1-2
Site 7 Location Map
Site 7 Non-Time-Critical Removal Action
Construction Completion Report
Naval Amphibious Base Little Creek
Virginia Beach, Virginia

AGVIQ
CH2M HILL

\\ariadne\groups\gis\USNavFaceNGCom\LittleCreek\Projects\Figure 1-3 Site 7 Western Drainage Canal.mxd

Legend

Shoreline

N
W E
S

0 250 500
Feet

Figure 1-3
Site 7 Western Drainage Canal
Site 7 Non-Time-Critical Removal Action
Construction Completion Report
Naval Amphibious Base Little Creek
Virginia Beach, Virginia

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CH2M HILL

SECTION 2

Scope of Work

The objectives of the NTCRA at Site 7 were as follows (JV I, 2006):

- Pre-characterize materials to be removed and disposed from the site for the purpose of obtaining representative chemical analysis to secure waste acceptance at an approved offsite disposal facility.
- Excavate, load, and transport and dispose (T&D) identified sediment and soil/debris to a qualified facility in accordance with state and federal regulations.
- Stabilize the existing east embankment of the western drainage canal (within the limits of the NTCRA).
- Provide soil cover maintenance on the western side of the landfill (within the defined limits Site 7 NTCRA) to create an integrated interface between the existing Site 7 soil cover system and the stabilized canal embankment (900 linear feet [lf]).
- Improve ecological habitat near the former access road canal crossing.
- Vegetate and restore backfilled areas of the NTCRA.

To complete these objectives, the following activities were performed and are described in Section 3:

- Pre-mobilization and coordination
- Mobilization and site preparation
- Waste characterization
- Excavation and disposal of sediments and soil/debris
- Canal bank stabilization
- Soil cover maintenance
- Site restoration and demobilization
- Construction Completion Report

SECTION 3

Summary of Action

This section provides details of the activities and construction sequences executed under Task Order (TO) 063. Photo documentation of the various phases and aspects of the Site 7 NTCRA are included in **Appendix A**.

3.1 Pre-mobilization and Coordination

3.1.1 Waste Characterization

Following the submission and review of the pre-construction submittals, pre-characterization of the sediments to be removed was conducted on August 15, 2006. Two composite samples were taken from the canal sediments for waste characterization. Sample collection and analysis was completed in accordance with the Work Plan (JV I, 2006). The waste characterization analytical data indicated non-hazardous disposal was appropriate for these materials (**Appendix B**). Therefore, the excavated sediment could be disposed at the BFI King and Queen Landfill.

3.1.2 Pre-construction ROICC Conference

A pre-construction meeting was held on September 13, 2006. Meeting attendees included representatives of the ROICC, NAVFAC MIDLANT, Commander Navy Region MIDLANT, Navy Regional MIDLANT Fire and Emergency Services, and JV I. This pre-construction meeting identified operational issues, specific protocols, client expectations, NAB Little Creek operating conditions, project goals, and key project team members.

3.1.3 Utility Search

JV I personnel requested a Miss Utility mark-out prior to site mobilization. The mark-out was completed on August 15, 2006. No utilities were identified within the limits of disturbance.

3.2 Mobilization and Site Preparation

JV I mobilized to the site on August 15, 2006 to complete the following activities:

- Security clearance of JV I project personnel and vehicles
- Delivery and set-up of a 10 foot (ft) by 40 ft office trailer with materials storage area
- Delivery and connection of a 30 kilowatt portable generator for the project trailer
- Delivery of maintenance equipment and safety materials
- Delivery of two portable sanitary units
- Establishment of project signage
- Clearing and grubbing

Limited clearing and grubbing was completed in August 2006 order to accommodate the office trailer and other support materials. Site clearing and grubbing was completed to coincide with the installation of erosion and sediment controls in August 2006.

Approximately 6 acres of the landfill surface was covered with vegetation (trees, brush, grasses, and vines). The original limits of clearing are presented on Sheet ES-1 of the Erosion and Sediment (E&S) Control Plan in the Work Plan (JV I, 2006). Removal of this vegetation was accomplished via standard tree clearing operations in accordance with procedures recommended by the United States Army Corps of Engineers (USACE) Engineering Manual 385 1-1. Vegetation clearing operations were performed by JV I personnel with previous experience in tree removal and land clearing operations.

Trees, brush, and saplings were removed via heavy equipment and consolidated in a central processing area via mechanized hydraulic equipment (excavator). Cleared vegetative material was reduced in size via wood chipper. Existing surface debris consisting of concrete pieces, metal, and stumps were removed and transported to a staging area for offsite disposal and/or recycling. Wood chips were stockpiled for later use as temporary erosion control within the excavation area. Reduced material was spread into a thin layer over the excavation area. All personnel utilized appropriate protective safety equipment (chaps, hardhats with face shields, safety glasses, leather gloves, hearing protection) during clearing operations.

3.3 Installation of E&S Controls

Several E&S control features were required and implemented in August 2006 in order to safeguard against potential runoff of disturbed sediments from the site. Stormwater runoff discharges from the site into a tidal tributary to Little Creek Cove, making E&S control a critical and highly visible requirement of this project.

3.3.1 Silt Fence

Silt fence was installed around the project site limits as the primary system to control sediment laden storm water runoff from leaving the construction area. Silt fence was installed using an excavator.

Silt fence was installed along the approximate alignment identified in Sheet ES-2 of the E&S Control Plan with only minor adjustments due to localized topography and obstructions. The excavator was used to generate a 6-inch-deep trench for the placement of the “skirt” portion of the silt fence. The silt fence skirt was installed in the trench by JV I personnel and was backfilled with soil generated from the trenching operation and tamped in place. The silt fence was inspected and maintained throughout the duration of site activities.

3.3.2 Construction Entrance and Access Road

The existing construction entrance off Helicopter Road was utilized for this project. In addition, two construction entrance areas were created using Virginia Department of Transportation (VDOT) # 1 material to prevent the tracking of site materials onto facility roads.

3.3.3 Erosion Control Matting

Once excavation activities were complete, temporary E&S matting was placed in shallow drainage swales along the edge of the soil cover extension. The E&S matting placement stabilized the swales and reduced the potential for erosion prior to the establishment of vegetation.

3.3.4 Turbidity Curtain

Turbidity curtains were utilized along the northern and southern portions of the canal adjacent to the site. The curtains were installed to provide sedimentation protection to the portions of the canal downstream and upstream of the areas to be excavated. Installation was accomplished using a long-reach excavator. Anchors were installed at both ends of each curtain and in several places along the length of the curtains to prevent movement. The turbidity curtains remained in place until excavation activities and site restoration were complete.

3.3.5 Temporary Dams

Temporary water-filled coffer dams were utilized along the northern and southern portions of the canal to block tidal water and any fresh water discharging from upstream into the canal. The dams were installed to provide sediment protection and facilitate dewatering of the canal prior to sediment removal between the downstream and upstream dams. Installation was accomplished using a long-reach excavator. The dams were then filled with water and remained in place until all sediment and backfilling operations were completed in the channel.

Dewatering operations were conducted between the temporary dams as described in Section 3.2.4.1 of the Final Work Plan which included implementing measures to minimize the pumping of sediment laden water from between the dams and to controlling the velocity at discharge point to the north of the excavation area.

3.4 Debris Removal

Preparation for the excavation included the removal of various types of debris from the landfill surface to facilitate equipment access throughout the full length of the impacted canal areas.

Table 3-1 summarizes the materials that were removed, consolidated, and disposed of or recycled at offsite facilities.

TABLE 3-1
Summary of Offsite General Debris Disposal/Recycle
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Material Type	Quantity	Unit	Facility
Recycle			
Mixed Concrete and Metal Debris	40	Tons	Simsmetal America, Chesapeake, VA
Disposal			
Sediment/Soil	2,858	Tons	BFI King and Queen Landfill, Little Plymouth, VA
Vegetation			
Miscellaneous Debris (e.g., lumber, railroad ties, reinforced concrete)	140	Cubic Yards	VICO – Chesapeake, VA
General Trash (e.g., cans, glass)			

Metal collected during the debris removal phase of the project was containerized in roll-off containers for offsite recycling. Removed debris was temporarily staged and loaded into roll-off containers for offsite disposal. Any trees or stumps that were removed during the site clearing and site preparation operations and could not be reduced via the onsite chipper were loaded and transported with the vegetation/miscellaneous debris.

3.5 Excavation, Transportation, and Disposal of Sediment

Excavation and loading equipment were utilized for the transfer of sediment from the channel to staging area for drying prior to offsite disposal. A track hoe excavator was used to excavate materials and a 25-ton dump truck was used to transport the materials to staging area. Each vehicle was filled to less than the maximum hauling capacity to avoid spillage. Removal quantities and depths were verified daily with the use of surveying equipment (**Table 3-2**).

TABLE 3-2
Summary of Depth of Sediment Removed
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Distance from bridge (ft)	Original Elevations (ft amsl)	Elevations After Removal (ft amsl)	Depth of Sediment Removed (ft)
25	-0.20	-1.79	1.59
50	-0.33	-1.69	1.36
75	-0.15	-1.19	1.04
100	0.47	-0.58	1.05
125	-0.04	-1.20	1.16
150	0.34	-1.16	1.50
175	-0.16	-1.26	1.10
200	0.20	-1.15	1.35
225	-0.09	-1.11	1.02
250	0.04	-1.16	1.20

TABLE 3-2
Summary of Depth of Sediment Removed
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Distance from bridge (ft)	Original Elevations (ft amsl)	Elevations After Removal (ft amsl)	Depth of Sediment Removed (ft)
275	-0.42	-1.43	1.01
300	-0.41	-1.53	1.12
325	-0.15	-1.37	1.22
350	-0.11	-1.37	1.26
375	-0.30	-1.65	1.35
400	-0.33	-1.65	1.32
425	-0.35	-1.65	1.30
450	-0.28	-1.73	1.45
475	-0.38	-1.83	1.45
500	-0.39	-1.83	1.44
525	-0.28	-1.71	1.43
550	-0.42	-1.93	1.51
575	-0.32	-2.18	1.86
600	-0.30	-2.40	2.10
625	-0.27	-2.40	2.13
675	-1.15	-2.15	1.00
700	-0.70	-2.04	1.34
725	-0.50	-1.89	1.39
750	-0.22	-2.02	1.80
775	-0.18	-1.88	1.70
800	-0.18	-2.06	1.88
825	-0.22	-2.60	2.38
850	-0.13	-2.77	2.64
875	-0.37	-2.24	1.87
900	-0.69	-2.14	1.45
925	-0.79	-2.40	1.61
	Average Depth Removed		**1.48**

amsl = above mean sea level; ft = foot/feet

Excavated materials from the western drainage channel were disposed offsite. A licensed subcontractor was retained to T&D excavated materials. Documentation in the form of sequentially numbered, generator-signed waste manifests was provided for each truck load prior to leaving the site (**Appendix B**). A total of 2,858.18 tons of sediment and debris were removed from the canal. This material was transported and disposed of at the BFI King and Queen Landfill in Little Plymouth, Virginia. T&D records are presented in **Appendix B**.

3.6 Backfill of Channel

After confirming the excavation limits had been achieved, JV I began backfilling operations on October 2, 2006. Analytical and geotechnical testing were performed on selected borrow sources for the backfill for a similar project for Site 8. The same fill materials were used at Site 7. Backfill material was sampled and analyzed for volatile organic compounds (VOCs); semivolatile organic compounds (SVOCs); total petroleum hydrocarbons (TPHs) such as diesel range organics; benzene, toluene, ethylbenzene, and xylene (BTEX); polychlorinated biphenyls (PCBs); and arsenic. The data were compared to USEPA Region 3 residential risk-based concentrations (RBCs), site background, and Virginia Solid Waste Management TPH and BTEX criteria. Borrow source analytical data for backfill and topsoil are presented in **Appendix C**.

Geotechnical borrow source testing included a sieve analysis and Unified Soil Classification System (USCS) soil classification by an independent testing laboratory utilizing American Society for Testing and Materials (ASTM) D 422 (Particle Size Analysis of Soils) and ASTM D 2487 (Classification of Soils for Engineering Purposes). The results of these tests are included in **Appendix C**. All backfill materials were free of debris, roots, scrape material, vegetation, and refuse. Backfill material was classified as poorly graded, gray, fine sand with trace silt.

As sediment and debris were removed from the channel, backfill material was placed in 6-inch lifts. Compaction of the backfill in the canal was achieved with the weight of the excavation equipment.

Backfill elevations were determined by original elevations and removal depths. Once the impacted sediment (1-ft depth) was removed from the western drainage canal (900 lf), the area was backfilled with 1 ft of clean fill, bringing the canal bottom back to its original grade.

After backfilling the canal, the temporary coffer dams were removed. The turbidity curtains were left in place both upstream and downstream of the impacted area.

3.7 Bank Stabilization and Soil Cover Maintenance

In addition to the NTCRA, the scope of work included bank stabilization of the eastern bank of the canal and landfill soil cover maintenance on the western edge of the prior landfill closure. The bank stabilization was achieved by removing all surface debris and ensuring a minimum of 2 ft of cover over any shallow debris. The bank was stabilized with open-cell-cable-tied concrete mats (8 ft × 16 ft) that were placed on the slope with an excavator. The upslope end of the mats was buried in an anchor trench per the manufacturer's recommendations. Each individual mat was tied to the mats placed on either side of it utilizing cables and clamps. This created a continuous mat to prevent erosion of the underlying bank. After installation of the open-cell-cable concrete mats, an additional 18 inches of clean fill and 6 inches of topsoil were placed along the top of the stabilized bank.

3.8 Wetland Installation and Protection

3.8.1 Wetland Furnishing and Installation

JV I subcontracted the furnishing of the tidal wetland plants to Emerald Forest, Inc. As part of site restoration, native wetland plants were delivered and planted at the site (**Table 3-3).** In addition, goose exclusion fence was installed to protect the plants from geese.

TABLE 3-3
Summary of Wetland Planting for Site Restoration
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Species	Common Name	Quantity
Spartina alterniflora	Saltwater Cord Grass	350 quarts

Grass seed was placed on disturbed areas and the soil cover extension (Table 3-4). As an additional effort, JV I filled the holes in the concrete mats used for bank stabilization with soil and seeded the soil.

TABLE 3-4
Summary of Seeding for Site Restoration
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Seed Type	Pounds per Acre Pure Live Seed
Big Bluestem (*Andropogon gerardi*)	4
Little Bluestem (*Schizachyrium scoparium*)	6
Switch Grass (*Panicum virgatum*)	2
Indian Grass (*Sorghastrum nutans*)	6
Canada Wild Rye (*Elymus canadensis*)	10
Partridge Pea (*Cassia fasciculata*)	2
Annual Rye Grass (*Lolium multiflorum*)	25

3.8.2 Wetland Protection and Guarantee

"Goose fencing" and flagging were installed in the newly created wetlands to deter predators from entering the site. The wetland plants will be guaranteed for 1 year from the completion of planting (June 2007 through June 2008).

3.9 Site Restoration and Demobilization

Site restoration activities included seeding of the soil cover areas and the planting of wetland plants as described in Section 3.8.1. Additionally, soil was placed within the open cells of the concrete mats used to stabilize the canal banks and seeded with the grass mix

summarized in Table 3-4. Due to the dry conditions of the soil within the concrete mats, the establishment of vegetation will continue to be monitored with re-seeding as necessary. The temporary erosion and sediment control (silt fence) was left in place as a precautionary measure while site grasses are establishing throughout the growing season (e.g., summer 2007).

Temporary facilities (construction trailer and equipment trailer) along with site equipment and staged materials were removed from the site in June 2007.

SECTION 4

Final Health and Safety Report

4.1 Key Health & Safety Accomplishments

The JV I expended a total of 4,404 hours (combined field and office) through March 16, 2007, implementing and executing this NTCRA. There were no Occupational Safety and Health Administration (OSHA)-recordable accidents or injuries on the project. It is the continued goal that zero injuries and illnesses are experienced for all projects executed by JV I. Achieving zero injuries and illnesses was largely due to the execution and constant evaluation of the Behavior-Based Loss Prevention System (BBLPS) by the JV I field team.

4.2 Behavior-Based Loss Prevention System

The BBLPS was implemented to prevent or reduce loss using behavior-based tools and proven management techniques to focus on behaviors or acts that may lead to loss.

The four basic loss prevention tools utilized include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Safe Work Observations (SWO)
- Loss and Near Loss Investigations (NLI)

The Site Superintendent was responsible for implementing the onsite BBLPS.

4.3 Implemented Safeguards Due to Site Conditions

The following sections highlight safe work practices implemented by the JV I project team as a result of unanticipated site conditions experienced during the execution of the project.

4.3.1 Safety Program Implementations

As a supplement to the BBLPS, JV I performed medical monitoring and training for all personnel. All JV I employees are enrolled in a Comprehensive Health and Safety Program that meets state and federal hazardous waste operations requirements for 40-hour initial training, on-the-job experience, and annual refresher training. In addition, JV I requires that all personnel performing work on a JV I project site pass a ten-panel drug screen.

4.3.2 Executable Safety Documents and Key Personnel

As part of the execution of the JV I safety program, several documents were produced and implemented by the project team. The following safety documents and supplemental references were utilized during execution of the project:

Implemented by JV I	Supplemental References
Health and Safety Plan (HASP)	USACE Engineering Manual 385 1-1
Accident Prevention Plan (APP)	Code of Federal Regulations (CFR) 1926
Hurricane Preparedness Plan (HPP)	29 CFR 1910
AHAs (total of 16)	USACE Construction Quality Management (CQM) Plan
PTSPs (daily)	

4.3.3 Project Audit

A health and safety audit was conducted on August 29, 2006, at the JV I project site. The audit was jointly executed by the JV I Health and Safety Manager (HSM) and the AGVIQ Corporate HSM. During the audit, only minor inconsistencies where identified (**Table 4-1**).

TABLE 4-1
Health and Safety Audit Findings
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Finding Number	Observation	Recommended Corrective Action
1	Failure to wear double hearing protection when operating chainsaw.	Review AHA and equipment specific safety with all personnel.
2	Personnel not wearing gloves for recommended tasks	Review requirements for personal protective equipment (PPE) with site personnel

Based on the site evaluation of the progress of the project, manner in which site work was being conducted, conditions of the site at the time of the audit, and a review of health and safety documentation, the site-specific and overall JV I objectives of the safety program were being met.

SECTION 5

Quality Control Report

JV I personnel maintained an effective QC program throughout the project. The purpose of the QC program was to ensure quality in the work before, during, and after the implementation of the removal action. The Site QC Manager (QCM) was responsible for the execution of the QC program.

5.1 Three Phases of Control

The QC program followed the three-phase approach based on the USACE CQM procedures: preparatory, initial, and follow-up. The primary purpose of the three-phase approach was to ensure the contractor planned, scheduled, and was prepared to begin each definable feature of work.

The preparatory phase was performed prior to beginning each definable feature of work. This phase included a review of the specifications, plans, and drawings, verification that materials met specifications, examination of the work area to ensure preliminary work was complete, a review of appropriate AHAs, and a discussion of the procedures for performing the work.

The initial phase was accomplished at the beginning of each definable feature of work. This phase verified that control for the work developed in the preparatory meeting was implemented and the work was performed to the level of quality mutually agreed to. This phase consisted of reviewing the preparatory meeting minutes, checking preliminary work, verifying the accuracy of controls, establishing levels of workmanship, and checking safety. An initial phase checklist was filled out for each definable feature of work.

The follow-up phase assured continued compliance with contract requirements until completion of the definable feature of work. QC reports and daily reports are presented in **Appendix D**, respectively.

5.2 Record Drawing

An as-built survey was conducted on April 11, 2007, to document the final site condition by a licensed surveyor. The project drawings were used as a general guide for establishing side slope grades and wetland restoration elevations (per the work plan). The as-built record drawing is included in **Appendix E**.

5.3 Inspection Program

Inspections by the Site QCM were divided into the following seven definable features of work:

- E&S controls installation
- Clearing and grubbing
- Debris removal
- Excavation
- T&D
- Backfill
- Site restoration

5.3.1 E&S Controls Installation

The first definable feature of work was identified as the E&S controls installation and included the installation of the silt fence and turbidity curtains. The preparatory meeting for this definable feature of work was held on August 15, 2006. The associated activities were reviewed with the Site Superintendent and work crew at the meeting. The site safety officer (SSO) presented the AHA for the work. Site work began on August 15, 2006, and the initial inspection was conducted the same day. Prior to the initiation of work, a site survey was performed to lay out the limits of the site and locations of the E&S controls. The Site QCM verified that the utility search and mark-out had been completed (utility mark-out also occurred on August 15, 2006). The crew was instructed that no earth disturbance activities were to be conducted until the site E&S controls were in place. Daily inspections of E&S controls installation activities were performed and documented to ensure work was conducted appropriately.

5.3.2 Clearing and Grubbing

The preparatory meeting for clearing and grubbing was conducted on August 16, 2006. The associated activities were reviewed with the Site Superintendent and the work crew. The SSO reviewed the AHA for clearing and grubbing. Clearing was required in order to perform the site survey to accurately define the limits of excavation. Clearing was initiated on August 16, 2006 and the initial inspection was conducted that day. Daily inspections were performed and documented to verify that the work was conducted appropriately.

5.3.3 Debris Removal

Debris removal was performed concurrently with the excavation activity (Section 5.3.4). The preparatory meeting for debris removal and demolition (some reduced and buried onsite, some removed) was conducted on September 20, 2006. The SSO reviewed associated activities and the AHA with the Site Superintendent and work crew. Activities began the same day. The Site QCM conducted an initial inspection to verify that the work was being conducted properly.

5.3.4 Excavation

The preparatory meeting for excavation was conducted on September 22, 2006. The Site QCM reviewed the activities and the SSO reviewed the AHAs with the Site Superintendent and work crew. The Site QCM verified that preliminary work, including the installation of E&S controls had been performed. The design drawings were also reviewed. Excavation activities began on September 22, 2006, and the Site QCM performed the initial inspection to verify the work was being completed as planned. The Site QCM performed follow-up inspections for the duration of the activity.

5.3.5 Transportation and Disposal

The Preparatory Meeting for transportation and disposal was conducted on October 19, 2006. The Site QCM and the SSO reviewed the AHAs with the Site Superintendent and work crew. The Site QCM verified that preliminary work had been performed, including the completion of waste characterization sampling and submission of the analytical results to the Navy and the disposal facility, verification that the non-hazardous waste manifests were ready for signature, and verification that the disposal facility was licensed and approved. The offsite recycle/disposal of materials is summarized in **Table 3-1**. This activity was initiated on October 19, 2006, and the Site QCM performed the initial inspection to verify that work was completed as planned. Follow-up inspections were performed daily for the duration of the activity.

5.3.6 Backfill

The Preparatory Meeting for backfill operations was conducted on October 2, 2006. The Site QCM reviewed the preparatory phase checklist and the SSO reviewed the AHA with the Site Superintendent and work crew. Backfill operations began at southern end of the western drainage canal on October 2, 2006. The Site QCM performed the initial inspection to verify that work was being performed as planned. The Site QCM verified that the preparatory work had been performed prior to initiation of the activity, including analytical and geotechnical testing of the backfill material. Documentation of the analytical and geotechnical testing and results is included in **Appendix C**. Follow-up daily inspections were performed for the duration of the activity.

5.3.7 Soil Cover

The Preparatory Meeting for the soil cover activity was conducted on November 1, 2006. The Site QCM reviewed the preparatory phase checklist and the SSO reviewed the AHA with the Site Superintendent and work crew. Soil cover operations began on November 1, 2006. The Site QCM performed the initial inspection to verify that work was being performed as planned. The Site QCM verified that the preparatory work had been performed prior to initiation of the activity, including analytical and geotechnical testing of the soil cover backfill material.

5.3.8 Wetland Planting

The Preparatory Meeting for wetland planting was conducted on June 8, 2007. The Site QCM reviewed the preparatory phase checklist and the SSO reviewed the AHA with the Site Superintendent and work crew. JV I subcontracted Emerald Forest, Inc. to furnish the wetland plants and the installation occurred on June 8, 2007. The Site QCM performed the initial inspection to verify that work was being performed as planned. The Site QCM verified that the preparatory work had been completed prior to initiation of the activity, including inspection of the seedling plants and verification of planting locations. A follow-up inspection was performed.

5.3.9 Site Restoration

The Preparatory Meeting for canal restoration was conducted on October 2, 2006. Wetland planting occurred on June 8, 2007. Seeding occurred on February 8, 2007 and May 21, 2007. The Site QCM reviewed the preparatory phase checklist with the Site Superintendent and work crew and verified that preliminary work had been completed. The SSO reviewed the AHA for the activity. Preliminary work consisted of verifying topsoil and seed mixture. Prior to initiation of the site restoration activities, the Site QCM inspected the site to ensure it was in suitable condition for seeding and prepared the initial checklist to verify that the work was being done properly. Follow-up inspections were conducted by the Site QCM on each day of the activities.

5.4 Site Inspection

A pre-final inspection was conducted by the Site QCM on February 20, 2007, to identify any concerns prior to demobilization of equipment and personnel. The following items were noted:

- Demobilize equipment and temporary facilities.
- Remove the E&S controls and turbidity curtains (to be removed after grass is established on soil cover extension – likely spring 2008).
- Work trailer and miscellaneous supplies still onsite (to be removed in June 2007)

An official final inspection was not scheduled by the ROICC (to be scheduled); however, the ROICC representative conducted a site visit and was satisfied with the condition of the site.

As of June 2007, issues with the soil and grass seed (additional effort by JV I) on the concrete mats used for bank stabilization have been identified during site visits. The grass has not been established on the concrete mat cells. A new grass seed will be used that is more resistant to dry conditions or other engineering controls will be implemented. Therefore, site inspections and site restoration are ongoing. The final version of this construction completion report will detail the final conditions and materials.

SECTION 6

Schedule and Material Summary

The following section summarizes the project schedule and cost for the NTCRA at Site 7. This section applies specifically to the removal action construction and documentation process under TO 063. It does not include preliminary work or the conceptual design process, which were conducted under separate TOs.

6.1 Schedule

TO 063 was originally awarded to JV I on March 18, 2005, in conjunction with TO 044 (Site 8). Due to an increase in scope of Site 8, Site 7 was broken out into a separate TO with new funding (TO 063). Pre-construction submittals were immediately initiated, including the preparation of the Work Plan, HASP, and QC Plan. In addition, preparation for field mobilization and procurement of materials and subcontractors began. The Draft Work Plan was submitted for review on April 27, 2005, followed by the Final Work Plan on August 31, 2005. The pre-construction meeting was held on September 13, 2006, by the ROICC office. Mobilization for field work began prior to the pre-construction on August 15, 2006.

The originally planned project schedule was extended because of additional work added after the project started. The additional work consisted of landfill maintenance activities to complete an additional 160 feet of bank stabilization and extending the soil cover to the northwest "upland" corner of the site to complete the NTCRA (canal sediment removal and restoration) and the maintenance activities (bank stabilization and soil cover extension) along the entire western side of Site 7. There were 10 production days lost during the project due to weather-related issues. The construction schedule is presented in **Table 6-1**.

TABLE 6-1
Fieldwork Schedule
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Activity	Begin Date	Duration
Mobilization, Site Preparation	August 15, 2006	1 day
Pre-Characterization Sampling for Re-use and Offsite Disposal	August 15, 2006	1 day
Installation of E&S Controls	August 15, 2006	Duration of job
Clearing and Grubbing	August 16, 2006	3 weeks
Excavation of Site 7 Western Drainage Canal Sediments and Debris Removal	September 20, 2006	1 week
Backfill and Restoration of Canal	October 2, 2006	1 week
T&D	November 1, 2006	1.5 weeks
Soil cover and Bank stabilization	November 1, 2006	3 months

TABLE 6-1
Fieldwork Schedule
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Activity	Begin Date	Duration
Soil fill interlocking concrete mats	May 14, 2007	1 week
Seeding soil cover and other disturbed areas	February 8, 2007	2 days
Seeding soil in concrete mats	May 21, 2007	1 day
Wetland planting	June 8, 2007	1 day
Cleanup Demobilization	February 2007	Ongoing / TBD
Construction Completion Report Draft	Submitted June 2007	-

6.2 Material Summary

The following table summarizes the quantity of general fill, topsoil, aggregate and other materials purchased and incorporated in the final construction of the soil cover structure and bank stabilization.

TABLE 6-2
Summary of Construction Materials
Construction Closeout Report, Site 7 Non-Time-Critical Removal Action

Material Type	Quantity	Unit	Incorporated Use
Imported General Backfill	8,000	yd^3	common fill
Imported Top Soil	2,000	yd^3	Top Soil
Seed			
21A Stone	246.55	tons	Road repair
Riprap	150	tons	Drainage areas and end of bank stabilization
Sand	1,778	yd^3	Canal backfill
VDOT #1	212	tons	Road repair

yd^3 = cubic yards

SECTION 7

References

AGVIQ-CH2M HILL Joint Venture I (JV I). 2006. *Final Work Plan, Non-Time-Critical-Removal Action, Site 7, Naval Amphibious Base Little Creek, Virginia Beach, Virginia*. September.

CH2M HILL. 2004. *Ecological Risk Assessment, Site 7 – Naval Amphibious Base Little Creek, Virginia Beach, Virginia*. November.

CH2M HILL. 2005a. *Final Engineering Evaluation/Cost Analysis for Site 7, Naval Amphibious Base Little Creek, Virginia Beach, Virginia*. February.

CH2M HILL. 2005b. *Technical Memorandum: Debris Delineation Results for Site 7 – The Amphibious Base Landfill, NAB Little Creek, Virginia Beach, Virginia*. November 17.

Appendix A
Photograph Log

Site Preparation

Pre-remedial action canal looking north.

Washed out culvert.

Concrete and metal debris on western edge of landfill.

Concrete and mixed debris on western edge of landfill.

Anchor removed from wetlands.

Wood debris on western edge of landfill.

Clearing for soil cover extension.

Concrete debris.

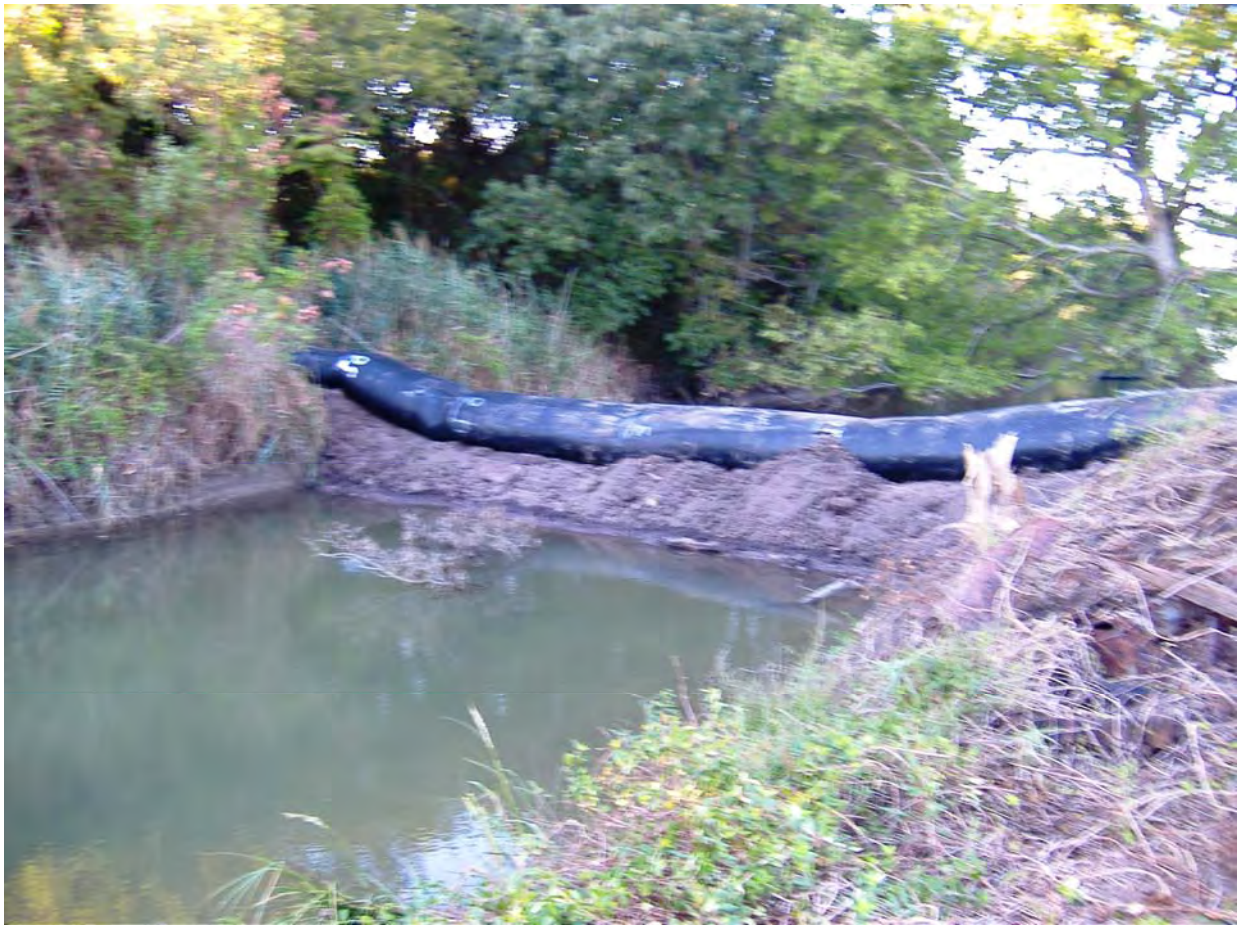
Clearing.

Clearing.

Placing culvert.

Common fill stockpile.

Aquadam at Amphibious Drive bridge.



Earth fill to raise aquadam at north end of excavation area.

Turbidity curtain.

Pre-remedial action canal north end.

Partial photograph of No. 1 Stone used for construction entrance (constructed entrance the access road was to the right in the photograph)

Sediment Removal

Excavation of sediment.

Excavation of sediment.

Excavation of sediment.

Excavation of sediment.

Excavation of sediment. Survey equipment.

Excavation of sediment.

Excavation of sediment. Survey equipment.

Backfill of Canal

Covered excavated sediment on liner.

Dump truck dumping clean sand fill. Long-reach excavator placing fill.

Long-reach excavator placing fill.

Long-reach excavator placing fill.

Survey equipment for determining fill quantity and elevation.

Survey equipment for determining fill quantity and elevation.

Repaired washed out culvert area.

Landfill Soil Cover Extension
and
Bank Stabilization

Bank stabilization and landfill extension tie-in.

Stockpile for landfill extension.

Bank stabilization and landfill extension tie-in.

Checking for at least 2 ft soil depth for embankment stabilization and soil cover extension tie-in.

Checking for at least 2 ft soil depth for embankment stabilization and soil cover extension tie-in.

Placing pen-cell-cable-tied concrete mats (8 ft by 16 ft) for bank stabilization. Cells to be filled with soil.

Wetland Plants

Planted *Spartina alterniflora* (smooth cordgrass) with goose fencing.

Temporary erosion matting and check dams within shallow drainage swales immediately after grading

(Additional photographs provided electronically)

Appendix B
Waste and Transportation and Disposal Records

(Provided electronically)

Appendix C
Borrow Source Analytical and Geotechnical Results

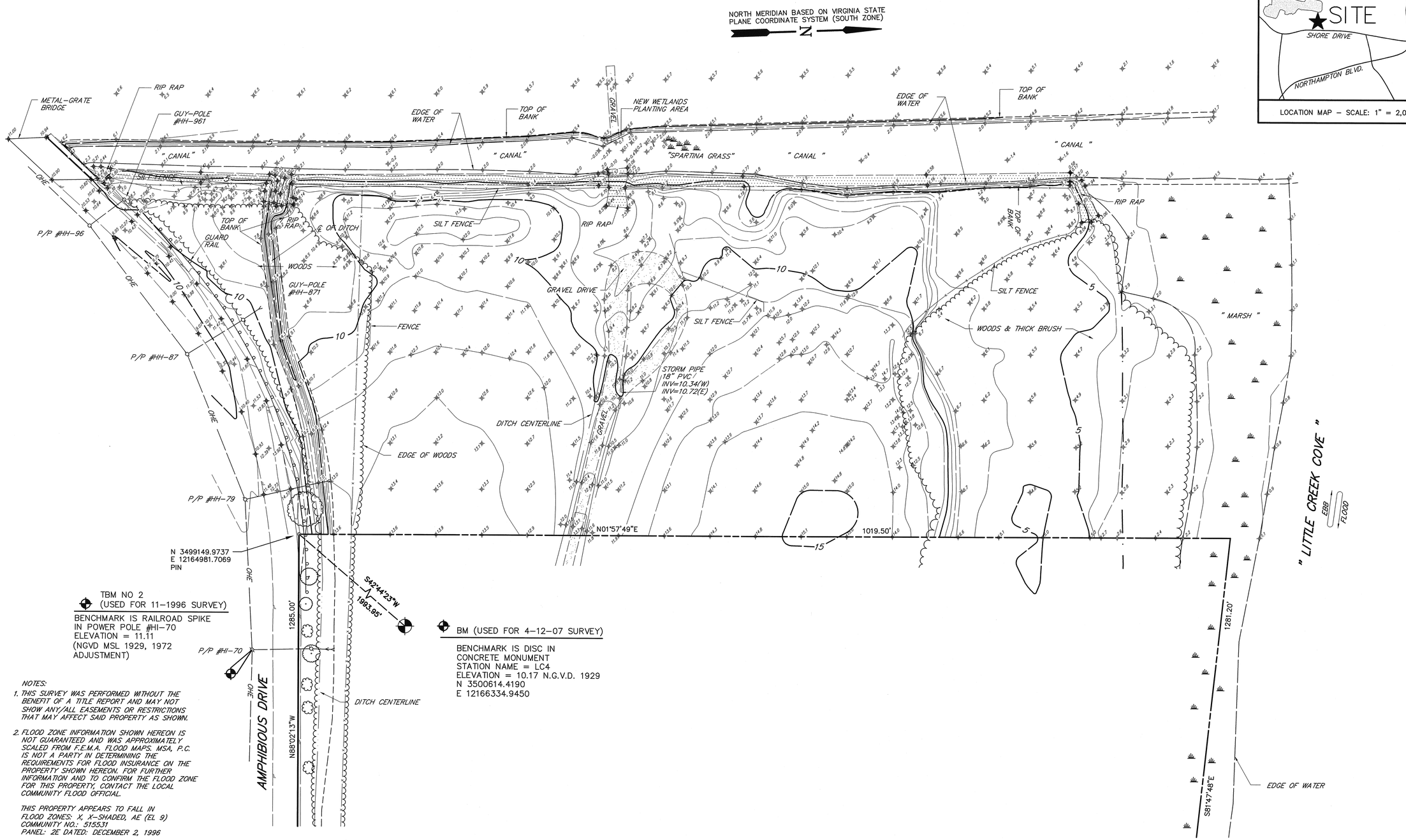
(Provided electronically)

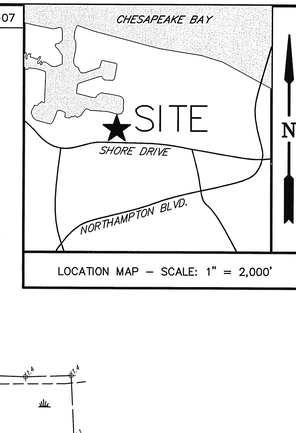
Appendix D
Daily and Quality Control Reports

(Provided electronically)

Appendix E
Record Drawing

1	REV	ADDRESS CLIENT COMMENT E-MAIL (6-13-07)	DSM	6-14-07





LOCATION MAP – SCALE: 1" = 2,000'

TBM NO 2
(USED FOR 11-1996 SURVEY)

BENCHMARK IS RAILROAD SPIKE IN POWER POLE #HI-70
ELEVATION = 11.11
(NGVD MSL 1929, 1972 ADJUSTMENT)

BM (USED FOR 4-12-07 SURVEY)

BENCHMARK IS DISC IN CONCRETE MONUMENT
STATION NAME = LC4
ELEVATION = 10.17 N.G.V.D. 1929
N 3500614.4190
E 12166334.9450

NOTES:

1. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT AND MAY NOT SHOW ANY/ALL EASEMENTS OR RESTRICTIONS THAT MAY AFFECT SAID PROPERTY AS SHOWN.

2. FLOOD ZONE INFORMATION SHOWN HEREON IS NOT GUARANTEED AND WAS APPROXIMATELY SCALED FROM F.E.M.A. FLOOD MAPS. MSA, P.C. IS NOT A PARTY IN DETERMINING THE REQUIREMENTS FOR FLOOD INSURANCE ON THE PROPERTY SHOWN HEREON. FOR FURTHER INFORMATION AND TO CONFIRM THE FLOOD ZONE FOR THIS PROPERTY, CONTACT THE LOCAL COMMUNITY FLOOD OFFICIAL.

   THIS PROPERTY APPEARS TO FALL IN FLOOD ZONES: X, X-SHADED, AE (EL 9)
   COMMUNITY NO.: 515531
   PANEL: 2E DATED: DECEMBER 2, 1996

   FLOOD ZONE DETERMINATION IS BASED ON THE FLOOD INSURANCE RATE MAPS AND DOES NOT IMPLY THAT THIS PROPERTY WILL OR WILL NOT BE FREE FROM FLOODING OR DAMAGE.

3. THE CURRENT OWNER OF THIS PROPERTY IS THE DEPARTMENT OF THE NAVY.

4. VERTICAL DATUM IS BASED ON STATION LC4, N.G.V.D. 1929
   ELEVATION = 10.17

5. HORIZONTAL DATUM IS BASED ON N.A.D. 1983.

6. AS-BUILTS WERE PERFORMED IN THE FIELD BY MSA, P.C. SURVEY CREW ON APRIL 12, 2007.

FB CS 315, PG 68

50' 0' 50' 100'
GRAPHIC SCALE
1" = 50'

MSA, P.C.
Landscape Architecture • Planning
Surveying • Engineering
Environmental Sciences
5033 ROUSE DRIVE, VIRGINIA BEACH, VA 23462-5708
PHONE (757) 490-9284 • FAX (757) 490-0034

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DESIGNED ____
DRAWN DSM
CHECKED ____
APPROVED ____
DATE 05-02-07

COMMONWEALTH OF VIRGINIA
STEPHEN L. WEBBER
No. 2306
LAND SURVEYOR

RECORD DRAWING OF
SITE 7, LANDFILL (TO-63)
LITTLE CREEK NAB

VIRGINIA
NORFOLK

SHEET 1 of 1 Sheets
SCALE: 1"=50'
PROJ. NO.: 05253B

Appendix F
Navy “Discharge at Risk” Letter to VDEQ

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC
9742 MARYLAND AVENUE
NORFOLK, VA 23511-3095

IN REPLY REFER TO
5090
EV3
August 16, 2005

Ms. Debra Thompson
Department of Environmental Quality
5636 Southern Boulevard
Virginia Beach, VA 23462

Subject: Naval Amphibious Base Little Creek, Site 7 - Former Amphibious Base Landfill and Site 8 - Demolition Debris Landfill

Dear Ms. Thompson:

1. The work plan for two projects being conducted at Naval Amphibious Base Little Creek (Encl.1) is being finalized. At Site 7 - Former Amphibious Base Landfill, sediments will be removed and replaced with clean fill. At Site 8 - Demolition Debris Landfill, sediments and landfill debris will be removed and wetlands will be restored. In order to complete this work, the Navy requests authorization to discharge surface/nuisance water to Little Creek Cove.

a. Site 7 - Former Amphibious Base Landfill
In order to remove sediments at Site 7, the contractors will install a portable dam system to isolate the canal to facilitate dewatering operations. The portable dam system will be installed during low tide to limit the infiltration of water from Little Creek Cove from entering into the area identified for removal (Encl. 2). Additionally, interim smaller diameter portable dams will be installed within the limits of the excavation. Once installed, a diesel powered pump will be used to dewater each section of the canal by transferring the water to the opposite side of the interim portable dam within the limits of the excavation area. The suction hose of the diesel pumps will be gradually lowered to minimize the disturbance of existing sediment.

Excavated sediment from the area of Site 7 will be removed with the bucket of a track hoe excavator. The wet material will be placed directly on the bed of a small, lined, off-road dump truck for transportation to the lined containment cell. As water settles from sediment in the containment cell, a submersible pump will be used to remove the water from the cell into a poly tank. The water in the tank will be properly characterized and disposed off at an off-site facility.

Once the sediments are removed, one foot of clean backfill material will be mechanically compacted along the limits of the excavation. Once completed the Navy will conduct a final site inspect and give authorization to remove the portable dams.

b. Site 8 - Former Demolition Debris Landfill
The contents of the former Demolition Debris Landfill will be excavated in order to restore and create a tidal salt marsh (Encl. 3). Excavation of the landfill will occur in a manner to allow the landfill to serve as its own detention basin. Once the contents of the landfill are removed, clean backfill material will be placed in the excavation to specified elevations for the planting of wetland species. In order to establish a viable tidal marsh, channels will be created to allow for the proper irrigation of the wetland plants. The tidal connector channels will be excavated last in the construction sequence (Encl. 4). As these connector channels are completed, turbidity curtains will be utilized to prevent the release of sediment-laden water from the excavation from entering into the tidal channel. If ponded water is present within the excavation at the time the tidal connector channels are excavated, check dam will be placed to prevent the sudden release of sediment-laden water through the connector channels. These check dams will be sand-filled bags or other measures that can be removed by hand to avoid having to move construction equipment over and/or through areas that have been graded for site restoration.

Once the salt marsh restoration is complete, the Navy will conduct a final site inspect and give authorization to remove the turbidity curtains and/or check dams.

Pond 2 will be part of the tidal salt marsh creation. The pond will be naturally drained during low tide. An earthen berm will be constructed along the north perimeter of the pond during low tide to prevent tidal water from entering the pond during cleanout activities. This will establish a minimum elevation for the surface waters. Nuisance water encountered during the remainder of the clean out of the waste and bottom sediment/debris in the pond will be managed by allowing the water to infiltrate into the excavated landfill. Once the water level in the pond stabilizes, the remainder of the removal will be excavated "wet".

5090
EV3
August 16, 2005

Once the sediments are removed, one foot of clean backfill material will be mechanically compacted along the limits of the excavation. Once completed the Navy will conduct a final site inspect and give authorization to remove the portable dams.

2. Should you have any questions, please contact Ms. Lora Fly at (757) 444-4125.

Sincerely,

Robert G. Schirmer

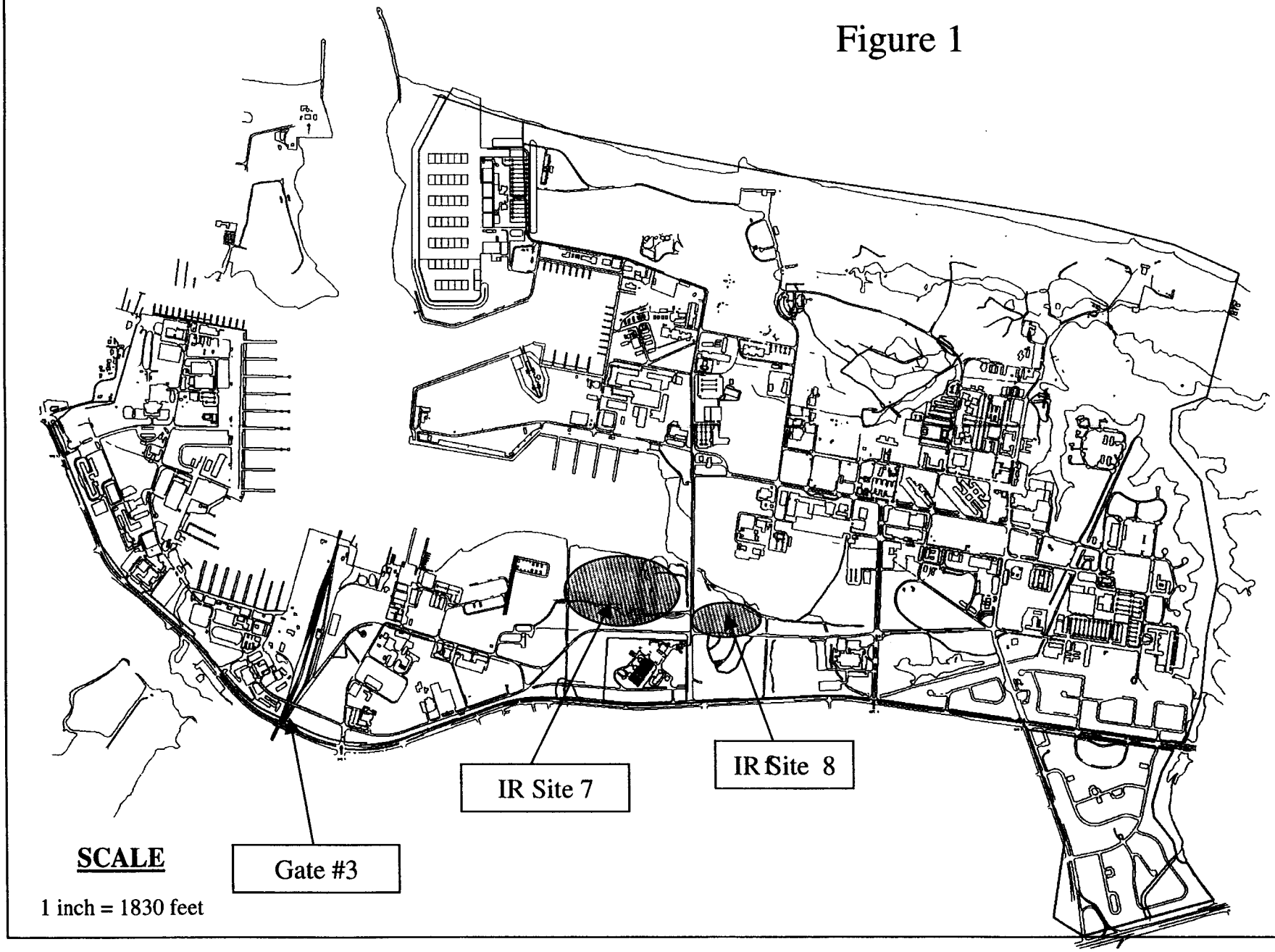
ROBERT G. SCHIRMER, P.E.
Coordinator,
Environmental Product Line
By Direction of the
Commanding Officer

Enclosures:
1. LC Vicinity Map
2. Site 7 EE/CA
3. Site 8 Work Element B
4. Restoration Plan

Copy to: CNRMA

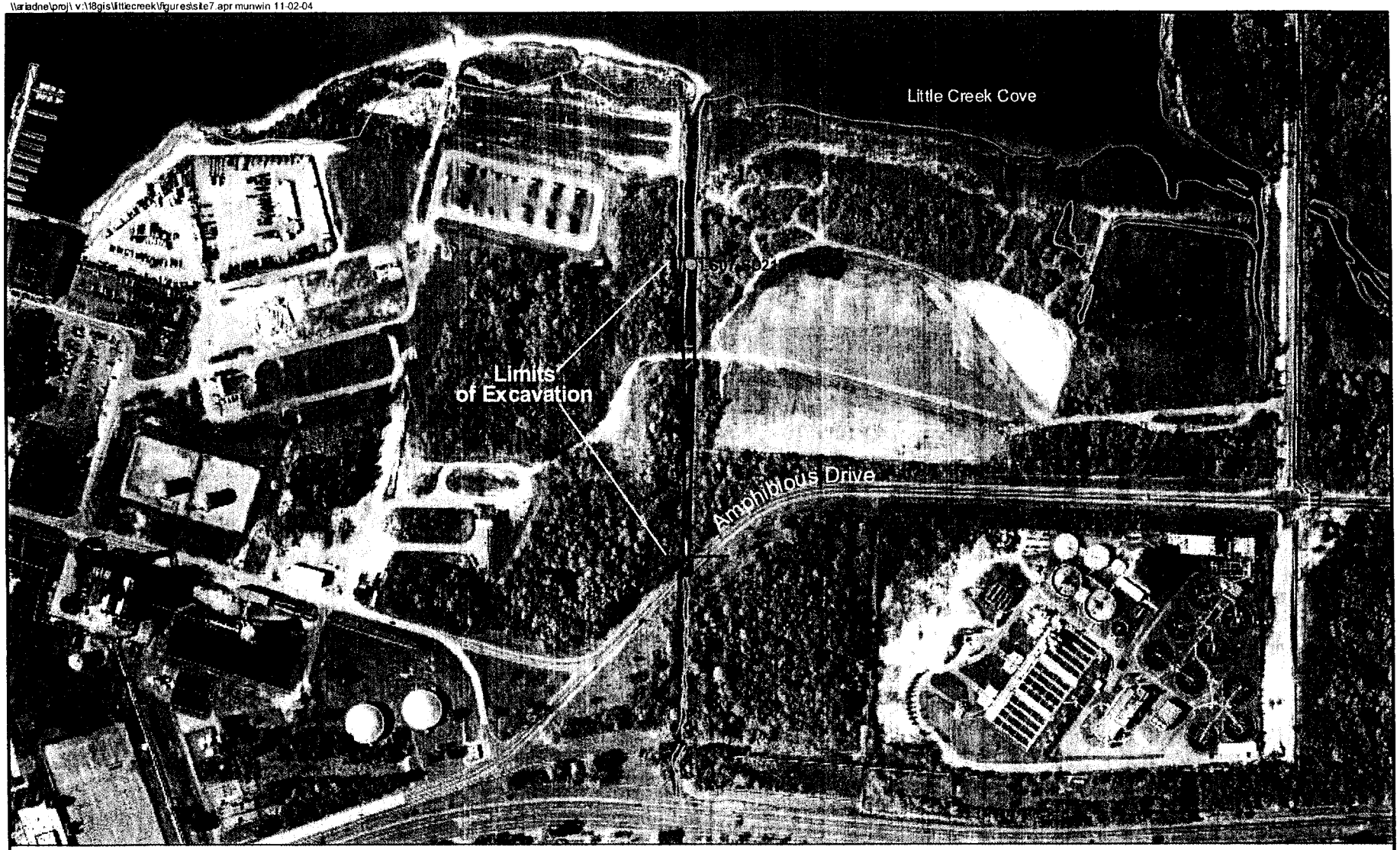
Naval Amphibious Base Little Creek

Figure 1



Enclosure (1)

\\ariadne\proj\ v:\18gis\littlecreek\figures\site7.apr munwin 11-02-04



LEGEND

- Sediment Sample Location
- Area of Excavation
- Limits of Excavation
- Shoreline

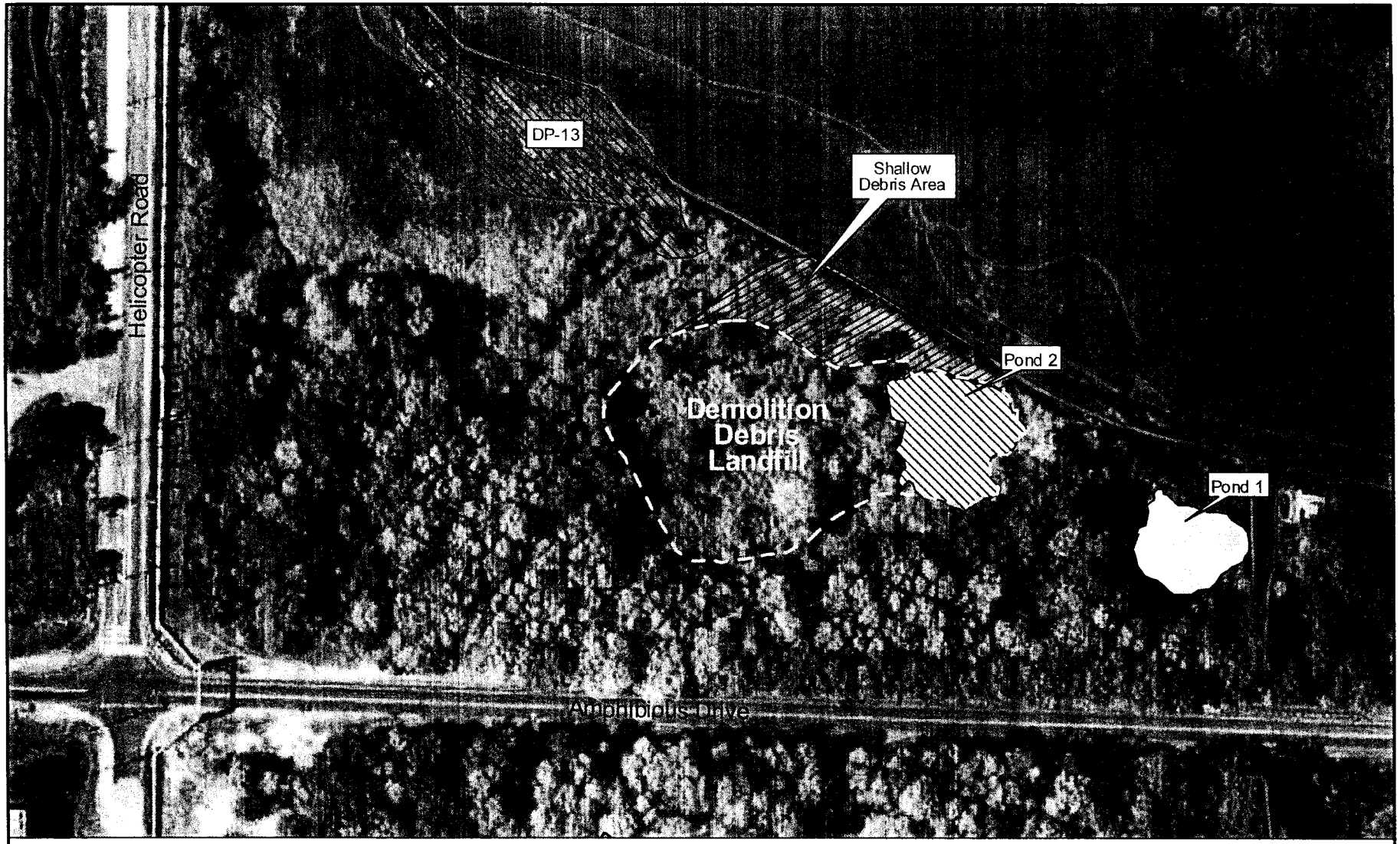
N

0 300 600 Feet

Figure 2
Site 7 - EE/CA
Removal of Contaminated Sediments
and Replacement with Clean Backfill
NAB Little Creek
Virginia Beach, Virginia

CH2MHILL

Enclosure (2)



LEGEND

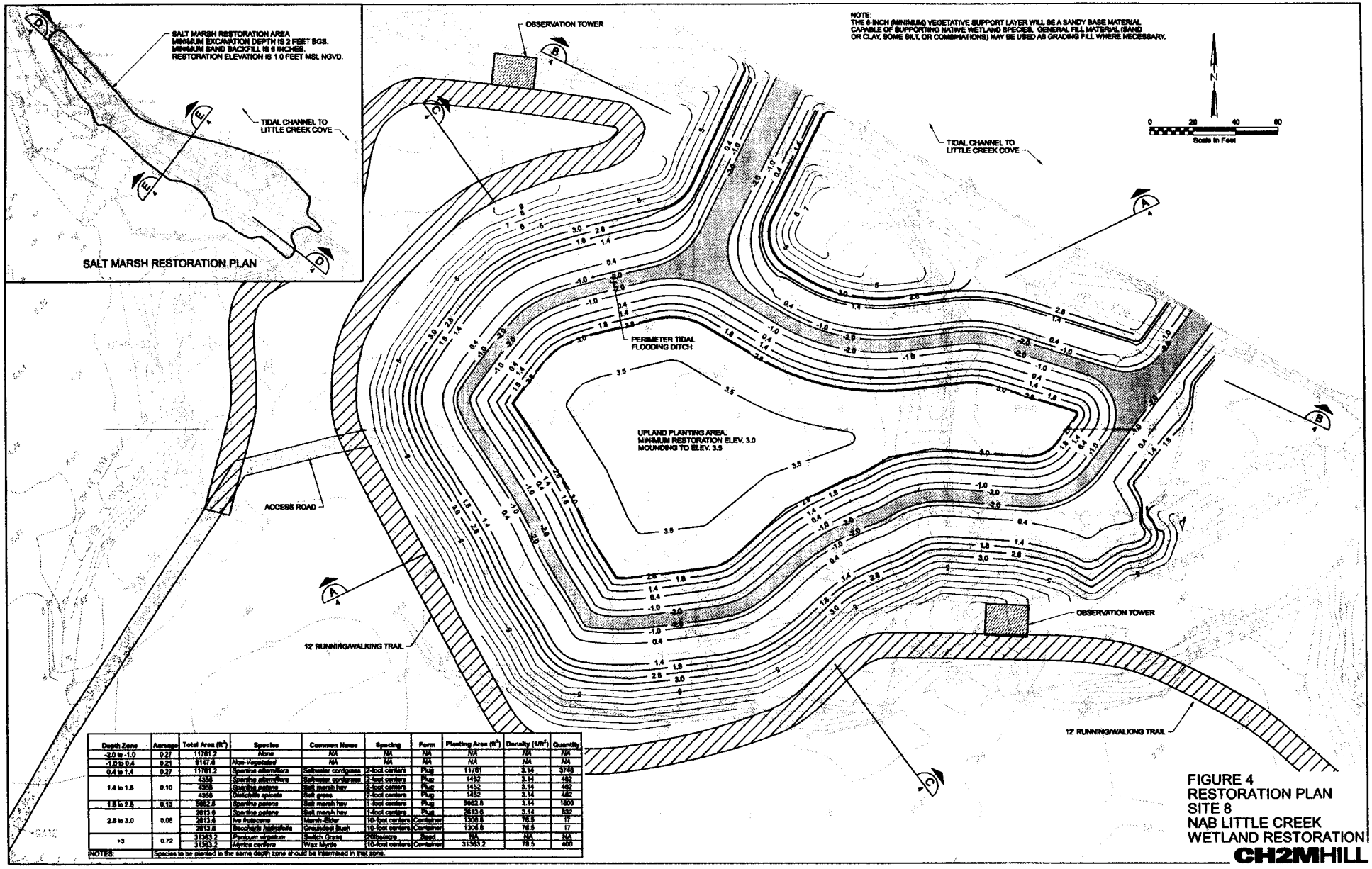
- Limits of Demolition Debris Landfill
- Water Features
- Ponds

N

0 75 150 Feet

Figure 3
Site 8 - Work Element B
Removal of Sediment Landfill Debris
and Creations of Salt Water marsh
NAB Little Creek
Virginia Beach, Virginia

CH2MHILL



Depth Zone	Acreage	Total Area (ft²)	Species	Common Name	Spacing	Form	Planting Area (ft²)	Density (1/ft²)	Quantity
-2.0 to -1.0	0.27	11761.2	*None*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
-1.0 to 0.4	0.21	9147.6	Non-Vegetated	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
0.4 to 1.4	0.27	11761.2	*Spartina alterniflora*	Saltwater cordgrass	2-foot centers	Plug	11761	3.14	3748
1.4 to 1.8	0.10	4356	*Spartina alterniflora*	Saltwater cordgrass	2-foot centers	Plug	1452	3.14	462
		4356	*Spartina patens*	Salt marsh hay	2-foot centers	Plug	1452	3.14	462
		4356	*Distichlis spicata*	Salt grass	2-foot centers	Plug	1452	3.14	462
1.8 to 2.8	0.13	5662.8	*Spartina patens*	Salt marsh hay	1-foot centers	Plug	5662.8	3.14	1800
2.8 to 3.0	0.06	2613.6	*Spartina patens*	Salt marsh hay	1-foot centers	Plug	2613.6	3.14	832
		2613.6	*Iva frutescens*	Marsh-Elder	10-foot centers	Container	1306.8	78.5	17
		2613.6	*Baccharis halimifolia*	Groundsel Bush	10-foot centers	Container	1306.8	78.5	17
>3	0.72	31363.2	*Panicum virgatum*	Switch Grass	200/acre	Seed	NA	NA	NA
		31363.2	*Myrica cerifera*	Wax Myrtle	10-foot centers	Container	31363.2	78.5	400
NOTES:		Species to be planted in the same depth zone should be intermixed in that zone.							

FIGURE 4
RESTORATION PLAN
SITE 8
NAB LITTLE CREEK
WETLAND RESTORATION

CH2MHILL

Enclosure (4)

PGN 645

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
TIDEWATER REGIONAL OFFICE
5636 Southern Boulevard, Virginia Beach, Virginia 23462
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L. Preston Bryant, Jr
Secretary of Natural Resources

David K. Paylor
Director

Francis L. Daniel
Regional Director

September 19, 2005

Mr. Robert G. Schirmer, P.E.
Coordinator, Environmental Product Line
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Avenue
Norfolk, VA 23511-3095

Re: Discharge of Surface/Nuisance Water
Naval Amphibious Base Little Creek
Site 7-Former Amphibious Base Landfill
Site 8-Former Demolition Landfill
Norfolk, VA

Dear Mr. Schirmer:

This is in response to your letter of August 19, 2005 concerning the discharge of surface/nuisance water at the subject facility. Please note that this type of discharge is not addressed in any Virginia Pollutant Discharge Elimination System (VPDES) permit for this facility, and the DEQ does not intend to modify the existing permit or issue a new permit to address this short-term discharge.

The Virginia Department of Environmental Quality (DEQ) recognizes the need to dewater the areas around the former base landfill and demolition debris landfill at the facility. If Little Creek determines that there is a need to discharge the water from this project to State waters, it will be considered a discharge that is not addressed in a VPDES permit, and will be done at the owner's and/or operator's own risk. The owner and/or operator will be responsible for remediating any environmental impacts or pollution complaints that are realized from these discharge activities.

You indicated in your letter that excavation of sediment from both sites will be conducted and interim dams installed to limit infiltration of Little Creek Cove into the removal areas. At Site 7, continuous pumping will be conducted to move water from cells to tanks for ultimate disposal off-site. Finally, mechanical compaction of clean backfill will be conducted along the limits of the excavation area. At Site 8, excavation /restoration will yield creation of a tidal salt marsh. It is understood that the landfill excavation area will serve as its own detention basin. Measures are outlined to prevent sudden release of sediment-laden water through the tidal channels during remediation/construction/restoration of the salt marsh. Finally it is understood that mechanical compaction of clean backfill material will be done along the limits of the excavation. Please note that this letter does not relieve the owner and/or operator from complying with any and all other applicable federal, state and local regulations.

Please notify this office once the dewatering project is completed. If it appears that this dewatering project and subsequent discharge of water is to become a routine event at the facility, the DEQ may modify the existing Virginia Pollutant Discharge Elimination System (VPDES) permit to address these discharges. If you should have future dewatering activities, please contact this office in advance of any discharge to State waters.

If you have any questions, or need additional information, please contact me at the above address, by Email: dlthompson@deq.virginia.gov, or by telephone at (757) 518-2162.

Sincerely,

Debra L. Thompson

Debra L. Thompson
Environmental Engineer Senior

Cc: DEQ-TRO file (PGN#645)