10/1/03-00207

Final Work Plan

Interim Remedial Action (Phase II) at Site 3

St. Juliens Creek Annex
Chesapeake, Virginia

Prepared for

Department of the Navy

Atlantic Division
Naval Facilities Engineering Command

Contract No. N62470-03-D-4401
Task Order-0005

October 2003

Prepared by

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Final Work Plan

Interim Remedial Action (Phase II) at Site 3 St. Juliens Creek Annex Chesapeake, Virginia

Task Order 0005

October 2003

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Under the:

AGVIQ/CH2M HILL JV I Program

Contract N62470-03-D-4401

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Virginia Beach, VA

Contents

Acronyms and Abbreviations ..... **v**

1 Introduction **1-1**
1.1 Base Background 1-1
1.2 Site 3 1-2
1.3 References 1-3

2 Previous Investigations **2-1**
2.1 Site Specific Investigations 2-1
2.1.1 Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA) 2-1
2.1.2 Engineering Evaluation/Cost Analysis (EE/CA)/Action Memorandum . 2-1
2.1.3 Phase I Interim Removal Action (IRA)—Site 3 2-2
2.1.4 Site 3 Removal Delineation 2-2
2.2 References 2-2

3 Objectives and Scope of Work **3-1**

4 Description of Activities **4-1**
4.1 Pre Mobilization Coordination 4-1
4.1.1 Utility Search 4-1
4.1.2 Haul Route Review 4-1
4.1.3 Pre Construction ROICC Conference 4-1
4.1.4 Procurement/Vendor Sourcing 4-2
4.2 Mobilization and Site Preparation 4-2
4.2.1 Waste Characterization Sampling 4-2
4.2.2 Mobilization/Site Setup 4-2
4.2.3 Work Zone Delineation 4-2
4.2.4 Erosion and Sediment Control 4-3
4.2.5 Spill Prevention 4-3
4.3 Excavation and Screening 4-4
4.3.1 Excavation and Screening Process 4-4
4.3.2 UXO Screening 4-5
4.3.3 Quantity Verification 4-5
4.3.4 Transportation and Disposal 4-5
4.3.5 Confirmation Sampling 4-5
4.4 Backfill and Restoration 4-6
4.4.1 Placement of Backfill 4-6
4.4.2 Seeding 4-7
4.4.3 Cleanup and Demobilization 4-7
4.5 Closeout Documentation 4-7

Appendixes

A Quality Control Plan
B Health and Safety Plan
C Erosion and Sediment Control Plan
D Environmental Protection Plan
E UXO Construction Support and Management Plan

Tables (Tables are located at the end of each section.)

4-1 Regulatory Levels for Waste and Fill Characterization
4-2 Background UTLs for Dredge Fill

Figures (Figures are located at the end of each section.)

1-1 Base Location Map
1-2 Site Location Map

3-1 Project Schedule

4-1 Site 3 Work Zone

Acronyms and Abbreviations

BTEX	benzene, toluene, ethylbenzene, and xylene
CLP	Contract Laboratory Program
COPCs	compounds of potential concern
CY	cubic yard
DRMO	Defense Reutilization and Marketing Office
E&S	erosion and sedimentation
EOD	explosive ordnance disposal
EPIC	Environmental Photographic Interpretation Center
ESCP	Erosion and Sediment Control Plan
HASP	Health and Safety Plan
HDPE	high-density polyethylene
IR	installation restoration
IRA	Interim Removal Action
JV I	AGVIQ-CH2M HILL Joint Venture I
LANTDIV	United States Navy Atlantic Division
NAVFACENGCOM	Naval Facilities Engineering Command
NCP	National Contingency Plan
NTR	Navy Technical Representative
OE	ordnance and explosives
PPE	personal protective equipment
RACR	Remedial Action Closeout Report
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction
SJCA	St. Juliens Creek Annex
SVOCs	semivolatile organic compounds
TAL	Target Analyte List
TCL	Target Compound List
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
UTL	upper tolerance limit
UXO	unexploded ordnance
VOCs	volatile organic compounds
WP	work plan

SECTION 1

Introduction

AGVIQ-CH2M HILL Joint Venture I (JV I) has been contracted by the United States Navy, Atlantic Division, Naval Facilities Engineering Command (LANTDIV NAVFACENGCOM) to provide environmental remediation services at St. Juliens Creek Annex (SJCA) for the Phase II interim remedial action (IRA) Site 3. This work will be performed under the terms and conditions of our existing contract, N62470-03-D-4401, Task Order 005.

This work plan is organized into four sections: Section 1 provides report organization and background information, 2—the previous investigations and remedial actions conducted at Site 3; 3—the objectives and the scope of work for this IRA; and 4—the task-specific description of the planned remedial activities.

Attached appendixes will include the following plans:

- Appendix A—Quality Control Plan
- Appendix B—Health and Safety Plan
- Appendix C—Erosion and Sediment Control Plan
- Appendix D—Environmental Protection Plan
- Appendix E—UXO Construction Support and Management Plan

1.1 Base Background

The SJCA facility, covering about 490 acres, is at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, in southeastern Virginia (Figure 1-1).

The Norfolk and Western Railroad, the City of Portsmouth, and residential areas border the facility on the north; to the west lie residential areas; St. Juliens Creek is south; and the Southern Branch of the Elizabeth River (Figure 1-2) is to the east. Most surrounding areas are developed and include residences, schools, recreational areas, and shipping facilities for several large industries.

St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. Past operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. The Annex has also been involved in specific ordnance operations in processes including those involving black powder operations, smokeless powder operations, projectile-loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. All ordnance-related activities at SJCA have been discontinued.

St. Juliens Creek Annex has also been involved in non-ordnance operations, including degreasing operations, paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash-rack operations, potable and saltwater fire-protection systems, and fire-

training operations. Many operations have been discontinued, such as printing and locomotive maintenance.

Activity at SJCA has decreased in recent years. SJCA's current primary mission is to provide a radar-testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Shore Intermediate Maintenance Activity (SIMA), a radar-testing facility, and a cryogenics school for tenant naval commands.

Materials stored at SJCA have included oil, ordnance materials, non-ordnance chemicals, and disaster-preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

1.2 Site 3

Site 3 is a former waste disposal area that covers approximately 2.1 acres in the Annex's northeastern corner and is accessible by way of a patrol road. The site is on the dredge-fill material that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. In earlier documents, Site 3 was referred to as "Dump C" and the aerial extent of Site 3 was initially reported to be about 10 acres.

Site 3 was originally a mudflat where refuse was allowed to burn; the ash was then used to fill the area. Operations began in 1940 and continued until 1970, prior to implementation of the Resource Conservation and Recovery Act (RCRA). After operations ceased at Site 3, the area was graded level and covered with grass (CDM, 1998). Review of historical aerial photographs, interpreted by the Environmental Photographic Interpretation Center (EPIC), indicate that the site and much of the adjacent area had been used for placement of dredge spoil material prior to use as a disposal area (USEPA, 1995).

Refuse disposed at Site 3 included limited process waste and mixed municipal waste. Prior to burning, the total volume of waste disposed was estimated to be about 27,778 cubic yards (CY). Salvageable materials were removed from the site each day, and the site was bulldozed once every 2 weeks for compaction and leveling (CH2M HILL, 2003).

Two pits at Site 3 were reportedly used for disposal of oil and oily sludge, as well as for periodically burning. The locations of the waste disposal pit and waste disposal area were outlined based on aerial photographs taken in 1958, 1961, 1964, and 1970 and interpreted by USEPA (USEPA, 1995). As identified in the photographs, the disposal pits were located along the north side of the dirt road that crosses the site. USEPA also interpreted ground scarring along the road to be possible waste disposal areas (CDM, 1998).

A Waste Delineation Investigation was conducted in June 2001 to determine the extent of waste at Site 3. An interview was conducted on December 18, 2001 with former SJCA employees. The interviews and intrusive investigations conducted as part of the 2001 RI showed that the extent of waste at Site 3 was substantially smaller than previously reported and the site was not an established landfill. As a result, the SJCA Partnering Team reclassified the site as a waste disposal area (CH2M HILL, 2003).

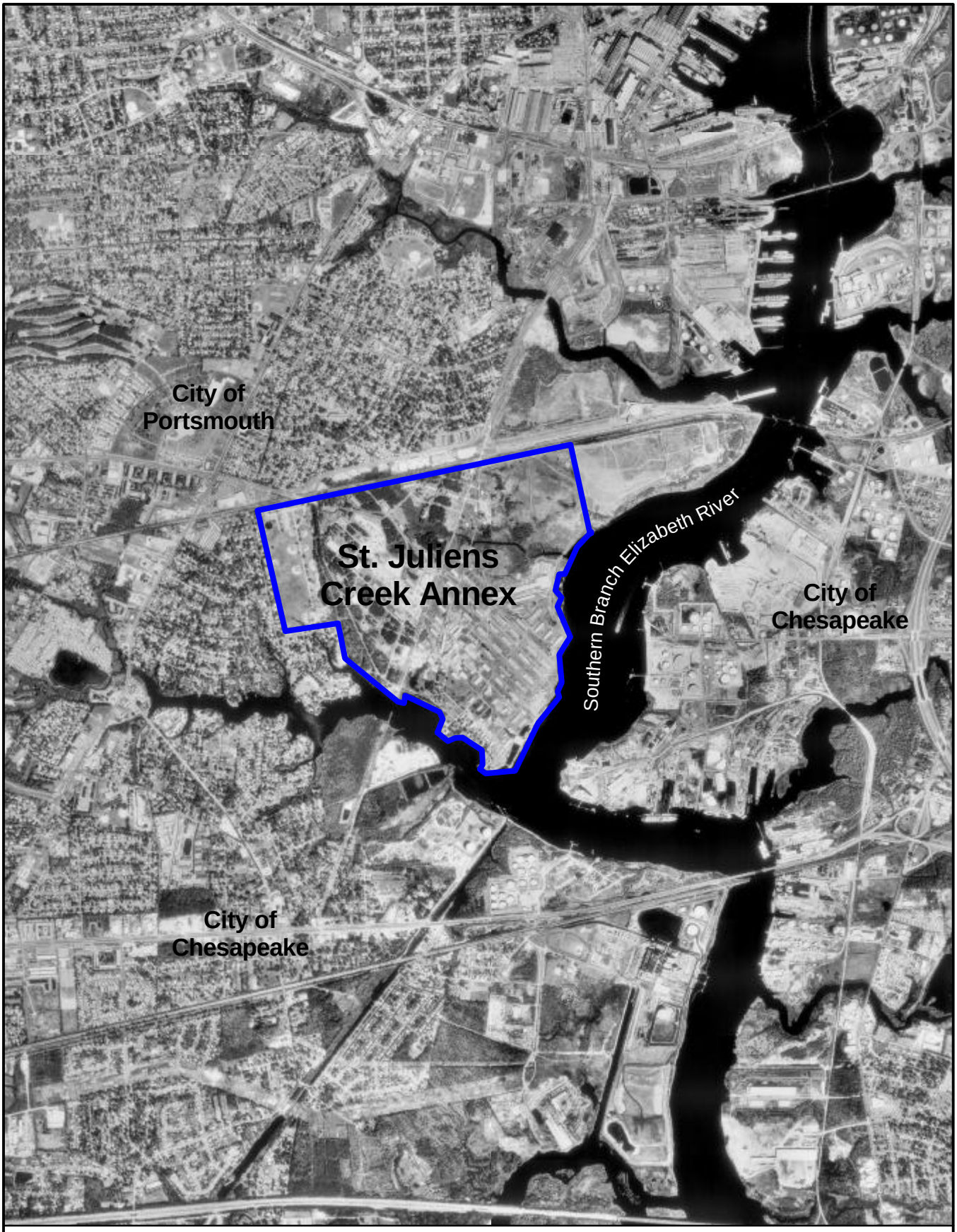
1.3 References

CDM Federal. *Draft Remedial Investigation and Human Health Risk Assessments Landfill C (Site 3) and Landfill D (Site 4*). St. Juliens Creek Annex, Chesapeake, Virginia. February 1998.

CH2M HILL, *Final Remediation Investigation/Human Health Risk Assessment/ Ecological Risk Assessment Report Sites 3, 4, 5, and 6.* St. Juliens Creek Annex, Chesapeake, Virginia. February 2003.

USEPA. *Aerial Photographic Site Analysis, Norfolk Naval Shipyard: Annex Areas.* Norfolk, Virginia. February 1995.

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

St. Juliens Creek Annex

N

0 2000 4000 Feet

Figure 1-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

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

LEGEND

- Site Locations
- Roads
- Railroads
- Activity Boundary

N

500 0 500 1000 Feet

Figure 1-2
Location of Site 3
within St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

SECTION 2

Previous Investigations

Several previous investigations have been conducted at Site 3. The following basewide documents included investigations of Site 3:

- Initial Assessment Study (IAS) in 1981
- Preliminary Assessment (PA) in 1983
- Phase II RCRA Facility Assessment (RFA) in 1989
- Relative Risk Ranking Data Collection (RRR) in 1996

The previous basewide investigations recommended further evaluation of Site 3.

2.1 Site Specific Investigations

Several investigations have been conducted at Site 3 to determine the extent of contamination, the fate and transport of compounds of concern and to determine the potential risk to human health and the environment. Additionally, an interim removal action was conducted, based on the results of these investigations, utilizing a selected removal alternative. The following sections describe the various documents and their findings.

2.1.1 Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA)

An RI/HHRA/ERA Report were completed for Site 3 in March 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, waste delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, and surface water samples. Debris and burnt/stained soils were visually identified within 30 inches (in.) of the ground surface at Site 3.

The RI identified compounds of potential concern (COPCs) at Site 3 as compounds that pose a potential risk based on human health and ecological risk assessments and were present at concentrations above the 95 percent upper tolerance limits (UTLs). Statistical comparison of site and background data and risk management considerations were used to define the potential site risks. These studies concluded that chemicals posing a potential risk in site 3 soil and sediment were inorganics, pesticides, and PAHs.

Engineering Evaluation/Cost Analysis (EE/CA)/Action Memorandum

Based upon the findings of the RI/HHRA/ERA, the Navy conducted an Engineering Evaluation/Cost Analysis (EE/CA) that explored three alternatives for addressing the non-time-critical removal action (NTCRA) at Site 3 (CH2M HILL, 2002). Criteria specified in the National Contingency Plan (NCP) were utilized to select site remedy (i.e. cost, effectiveness, implementability of each alternative, etc.) The selected alternative involved the removal of waste, soil, and upland ditch soil/sediment at Site 3 (Alternative 3) posing potential risk.

This alternative was selected since it best achieved the removal of potential risk at the site, thus providing the greatest protection of human health and the environment. The Navy signed an Action Memorandum in 2002, implementing the selected remedy (removal) specified in the EE/CA.

Based on the existing surface soil data, the SJCA Tier I Partnering Team agreed that the final removal in the EE/CA would include the waste area, the areas around sample locations where risk drivers were identified, an isolated hotspot, and sediment.

2.1.3 Phase I Interim Removal Action (IRA)—Site 3

In August and September of 2002, the Navy conducted a Phase I IRA at Site 3 that included excavation of visible burnt/stained soil and debris as well as surrounding material posing a potential risk to human health and the environment, waste characterization (including unexploded ordnance [UXO] screening and removal) for disposal, non-hazardous disposal of waste debris in a local landfill, and site restoration. The extent of the area removed included 3,300 CY of waste and soil. The remaining wastes left in place following Phase I were to be removed during a future action. A site closeout report and removal summary report detailed activities conducted under the Phase I IRA (OHM/Shaw, 2003 and CH2M HILL, 2003).

2.1.4 Site 3 Removal Delineation

In March 2003, CH2M HILL conducted an investigation to delineate the remaining soil, waste, and upland ditch soil (referred to in the RI as sediment) requiring excavation at Site 3 by obtaining samples from 55 locations to delineate the horizontal and vertical extent of removal required for Phase II removal actions. The Phase II removal will be conducted up to and through these sample locations.

The results of the analysis were statistically compared to established background concentrations to determine if clean closure of the site could be achieved. Based on the analysis, limits of required waste/soil removal were defined in all but one limited area. Therefore, a limited number of confirmatory samples (one) will be collected during the Phase II removal action.

2.2 References

A.T. Kearney, Inc. and K.W. Brown and Associates, Inc. *Phase II RCRA Facility Assessment of the St. Juliens Creek Annex Facility*. Chesapeake, Virginia. March 1989.

CH2M HILL. *Relative Risk Ranking System Data Collection Report.* St. Juliens Creek Annex to the Norfolk Naval Base. Chesapeake, Virginia. April 1996.

CH2M HILL. *Final Engineering Evaluation/Cost Analysis for Sites 3 and 6.* St. Juliens Creek Annex to the Norfolk Naval Base. Chesapeake, Virginia. June 2002.

CH2M HILL. *Final Action Memorandum for Sites 3 and 6.* St. Juliens Creek Annex, Chesapeake, Virginia. August 2002.

CH2M HILL. *Final Site 6 Closeout Report and Site 3 Removal Summary*. St. Juliens Creek Annex, Chesapeake, Virginia. March 2003.

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

NUS Corporation, Superfund Division. *Preliminary Assessment*. 1983.

Shaw Environmental & Infrastructure, Inc. (OHM Remediation Services Corp.). *Remedial Action Construction Closeout Report, RAC Action, St. Juliens Creek Annex, IRA at Sites 1, 3, 6, and 7.* Chesapeake, Virginia. January 2003.

SECTION 3

Objectives and Scope of Work

The objective of the scope of services discussed in this Work Plan (WP) will be to execute the following activities compliant with the Scope of Work issued for Task Order 005:

- Excavate and screen 13,181 CY of soil, waste, and sediment from Site 3
- Transport and dispose of soils, waste, and sediment at a Subtitle D landfill
- Backfill and restore the site to preconstruction grades

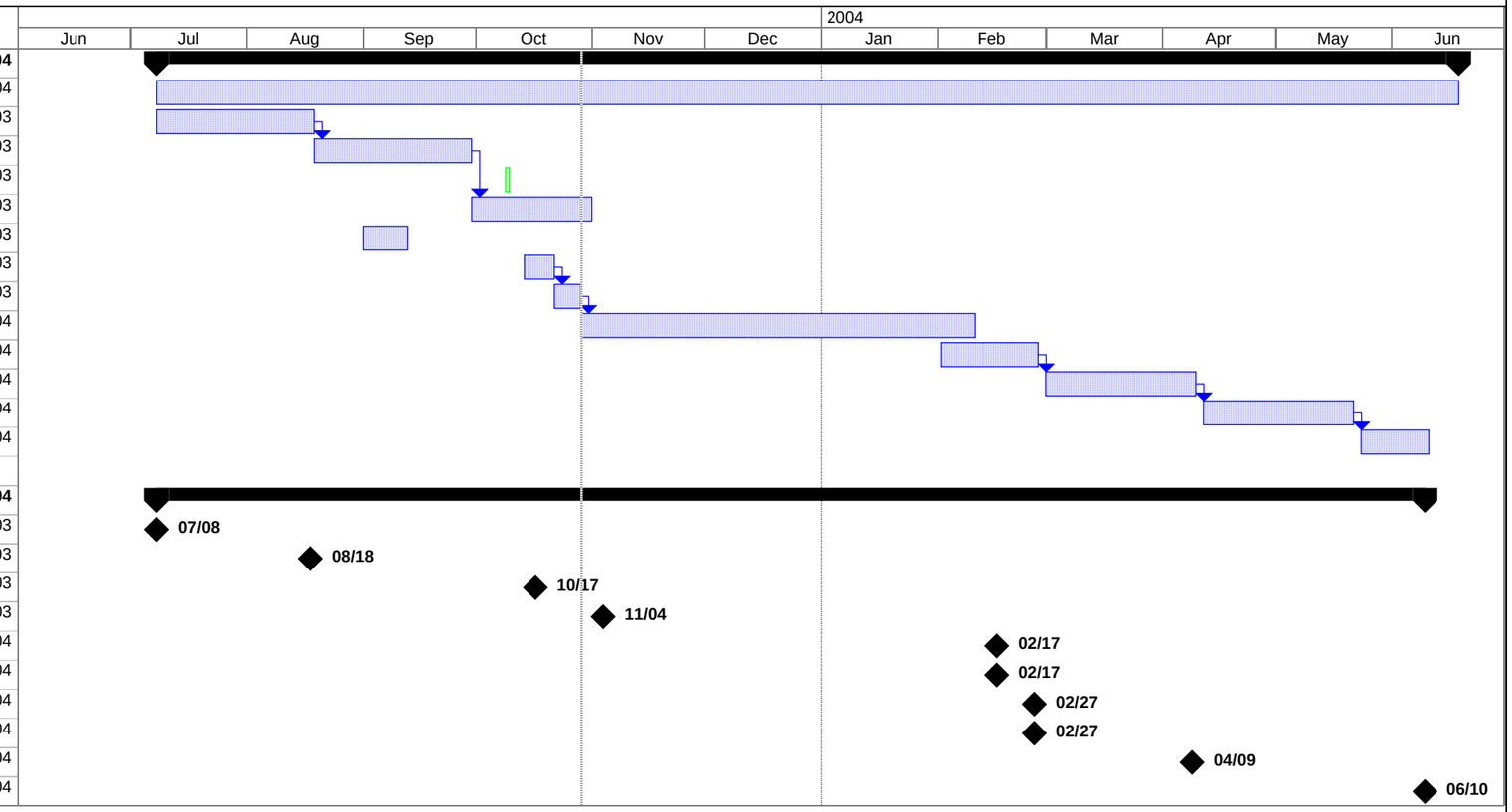
All activities associated with the scope of services for this Task Order will be performed in a safe, compliant, and expeditious manner. The following major activities are included in the scope of work for the Site 3 Interim Remedial Action:

- Pre mobilization coordination
- Mobilization and Site preparation
- Waste Characterization
- Excavation and Screening
- Backfill and Restoration
- Demobilization
- Closeout Report

The actual execution of the individual tasks will be pre-planned and continually adjusted to overlap durations of specific activities and perform other tasks consecutively to maximize the availability and utilization of onsite resources. The proposed project schedule is presented on Figure 3-1.

Figure 3-1
AGVIQ\CH2M HILL Joint Venture 1
Site 3 Interim Removal Action
St. Juliens Creek Annex
Chesapeake, Virginia

ID	Task Name	Duration	Start	Finish
1	**Site 3 IRA**	**249 days**	**Tue 07/08/03**	**Fri 06/18/04**
2	Project Planning	249 days	Tue 07/08/03	Fri 06/18/04
3	Draft Preconstruction Submittal	30 days	Tue 07/08/03	Mon 08/18/03
4	Regulatory Review (Navy, EPA, VDEQ)	30 days	Tue 08/19/03	Mon 09/29/03
5	Pre Construction ROICC Conference	1 day	Thu 10/09/03	Thu 10/09/03
6	Final Preconstruction Submittals	24 days	Tue 09/30/03	Fri 10/31/03
7	Procure Subcontractors	10 days	Mon 09/01/03	Fri 09/12/03
8	Mobilization/Site Survey and Pre Characterization	6 days	Tue 10/14/03	Tue 10/21/03
9	Site Preparation	5 days	Wed 10/22/03	Tue 10/28/03
10	Excavation and Screening/Confirmation Sampling	75 days	Wed 10/29/03	Tue 02/10/04
11	Backfill and Restoration	20 days	Mon 02/02/04	Fri 02/27/04
12	Draft Construction Closeout Report	30 days	Mon 03/01/04	Fri 04/09/04
13	Regulatory Review (Navy, EPA, VDEQ)	30 days	Mon 04/12/04	Fri 05/21/04
14	Final Construction Closeout Report	14 days	Mon 05/24/04	Thu 06/10/04
15				
16	**Site 3 IRA Invoicing**	**242 days**	**Tue 07/08/03**	**Thu 06/10/04**
17	Cost of Bonding	0 days	Tue 07/08/03	Tue 07/08/03
18	Submittal of Draft Pre Construction Submittal	0 days	Mon 08/18/03	Mon 08/18/03
19	Submittal of Final Pre Construction Submittals	0 days	Fri 10/17/03	Fri 10/17/03
20	Mobilization-Site Set Up/Site Preparation	0 days	Tue 11/04/03	Tue 11/04/03
21	Excavation-Screening Transportation & Disposal	0 days	Tue 02/17/04	Tue 02/17/04
22	Confirmatory Sampling	0 days	Tue 02/17/04	Tue 02/17/04
23	Backfill & Restoration	0 days	Fri 02/27/04	Fri 02/27/04
24	Cleanup & Demobilization	0 days	Fri 02/27/04	Fri 02/27/04
25	Draft Closeout Report	0 days	Fri 04/09/04	Fri 04/09/04
26	Final Closeout Report	0 days	Thu 06/10/04	Thu 06/10/04



Project: JV1 TO-005
Date: Wed 10/29/03

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

SECTION 4

Description of Activities

4.1 Pre Mobilization Coordination

To enhance the timely mobilization of Joint Venture I (JV I) resources and subcontractors and to meet operational schedule commitments, pre-mobilization efforts will begin immediately upon award of the construction-phase funding for the excavation of soils, waste, and sediment at Site 3. The following activities will be addressed as part of the premobilization coordination efforts. The location of known utilities, anticipated haul routes, site trailer location, and site fencing are shown on Figure 4-1.

4.1.1 Utility Search

JV I will request a utility mark-out prior to beginning the site setup and soil excavation activities. JV I will supply the Navy with a drawing outlining the work area at least 1 week prior to planned field activities. A field inspection to verify the locations of utilities will be conducted to prepare the site for all subsequent construction operations. The JV I will also use information collected during Phase I IRA.

4.1.2 Haul Route Review

Vehicle and truck traffic is inherent in soil-removal projects. JV I site management staff will predetermine truck delivery and egress routes to minimize congestion and facilitate loading and offloading operations. Prior to finalizing the vehicle routes, pre-existing conditions will be reviewed and documented. The entire onsite route, including all deficiencies and surfaces in need of repair, will be photographed and submitted to the Navy for future reference. The proposed vehicle route will be driven by the site management staff as a final confirmation to also ensure that no weight limitations exist over any crossings or culverts. The final site haul route will be posted and clearly marked for hauling vehicles entering and exiting the site and approved by the ROICC.

4.1.3 Pre Construction ROICC Conference

Prior to the proposed mobilization date for field activities, coordination with the Norfolk Naval Shipyard ROICC office will identify the date, time, and location for the pre-construction (Precon) conference. JV 1 representatives will attend the Precon along with Base fire, security, safety and environmental, LANTDIV personnel, AROICC and Construction representatives, and any other invited project "stakeholders." JV 1 attendees will be prepared to respond to any and all questions as well as to present an overview of the project scope, schedule, planned invoicing, Health and Safety concerns, Quality Control procedures, and any site logistical issues. This meeting will take place at least 3 weeks prior to mobilization of the construction efforts.

4.1.4 Procurement/Vendor Sourcing

Upon receipt of the Navy's notice to proceed, the JV I financial team will source and procure services, materials, and equipment required for the execution of the scope of work. To support this effort, the JV I project manager generates a procurement schedule that "timelines" each individual procurement item for the entire project duration. Pertinent information on each item will be available (i.e. deliverable deadline, quantity, duration). The procurement schedule sequences each procurement in the consecutive order it is required for delivery at the project location at the time it is required.

4.2 Mobilization and Site Preparation

4.2.1 Waste Characterization Sampling

In conjunction with the utility verification, a pre-characterization of Site 3 soil will be initiated to obtain analytical information for disposal acceptance.

Field sampling technicians will obtain a total of thirteen, five-point composite samples from the proposed soil profile in situ and submit the samples to a qualified laboratory for analysis of toxicity characteristic leaching procedure (TCLP) volatile organic compounds (VOCs), TCLP semivolatile organic compounds (SVOCs), TCLP metals, TCLP pesticides, TCLP herbicides, ignitability, reactivity, corrosivity (pH), total petroleum hydrocarbons (TPH), and extractable organic halogens (EOX). The analytical results will be compared to the regulatory levels included in Table 4-1 for waste characterization. Analytical results will be forwarded to the respective disposal firm(s) in support of finalizing waste acceptance and delivery schedules. The ROICC will be responsible for signing all non-hazardous waste manifests and a copy of the signed manifest will be forwarded to Mrs. Valerie Walker.

4.2.2 Mobilization/Site Setup

Construction personnel, equipment, and materials will be mobilized to the site to complete the project as defined in the statement of work. Initially, key individuals and equipment will be mobilized to the site to receive the office trailer and other equipment essential to complete the project activities.

Initial site setup activities will include preparing an area where the office trailer will be positioned. Additional personnel and equipment will be mobilized to the site as dictated by task resource demands, and subsequently released from the project when work assignments are completed.

4.2.3 Work Zone Delineation

Once initial mobilization and site setup are completed, site preparation activities will begin. A stabilized construction entrance will be prepared over the existing site access road as it abuts the Site 3 boundaries. To prevent the traveling of mud, dirt, or sediment onto the facility road surfaces, vehicles will remain on the gravel road (bisecting the site) at all times. Additionally, a temporary crushed stone entrance/exit will be created to prevent the tracking of mud, dirt, or sediment beyond the site boundary. Material from the truck tires will be visually monitored. Based on the visual inspections, if material is not adequately being displaced from the tires, a tire-wash will be set-up. The wash area would be

4.3 Excavation and Screening

4.3.1 Excavation and Screening Process

Excavation, screening, and loading equipment will be used for all the Site 3 soil materials. Material handling operations at the point of excavation and at the screening plant will be complimented by trained and qualified UXO technicians. Magnetometer screening and visual observations will identify any suspect item/shape that may require further inspection and/or special handling to determine its potential for unexploded ordnance.

A track hoe excavator will mechanically remove the targeted Site 3 materials a bucketfull at a time. To deliver Site 3 soils for processing, exhumed materials will be placed into a small 6–cy dump truck, the front bucket of a track loader, or directly into the screen plant hopper depending upon the exact location and distance from the point of excavation to the screening plant. Each filled hauling vehicle will be filled to something less than capacity to avoid spillage of materials during on site transport. Flagmen will direct and receive the hauling vehicles via predetermined travel routes across the site.

Materials will be processed through the screening plant to achieve a 1-in.-diameter sorting. Materials that contain significant amounts of clay will not be screened, the excavator will mechanically dislodge the clumps to expose all surface areas for adequate visual screening. Screened materials will be directed from the screening plant via conveyors that will discharge materials into a stockpile. The soil stockpile area will be constructed of an initial 20 mil high-density polyethylene (HDPE) layer, which will be overlain by 12″ inches of screened site soil, and covered with a final layer of 10 mil HDPE. No track vehicles will be permitted to enter this area to minimize the risk to tearing of the HDPE layers. Following the end of the removal action, these layers will be systematically removed. If during the removal of the area, any removal soil is noted beneath the initial 20 mil HDPE, that area will be scraped to a depth of 6″ and transported to the off site facility. Any stockpiled material not removed during the day will be covered with 10 mil HPDE and anchored to prevent the infiltration of precipitation.

Field survey crews will confirm material removal estimates periodically. Loading equipment will scoop the screened Site 3 soils from the accumulated stockpile. Predetermined truck sequencing, for the Site 3 materials off site hauling and disposal, will allow for placement of empty hauling vehicles adjacent to the load-out area. Spotters will support the loading operations to ensure level loading. Proper shipping papers will be completed for each load and the appropriate copies will accompany each load. A DOT certified offsite scale will be located for weighing a select number of initial loads to confirm hauling weight limits are not exceeded. All vehicles departing from Site 3 will exit via the installed stone wash pad for tire cleaning.

In the event extremely dry conditions are evident, JV I technicians will implement dust-control measures to minimize visible dust emissions from wind blown sediments.

This scope of work does not include provisions or costs for groundwater containment and/or sampling. It is assumed that any standing water encountered during excavation will be allowed to perchlorate prior to soil removal.

constructed on a portion of the gravel road which is scheduled to be removed. Rinse water from the tire-wash would be allowed to evaporate or percolate into the ground surface.

Detailed information regarding the temporary stone construction entrance can be found in the Erosion and Sediment Control Plan (Appendix C). The installation of support facilities will include the delivery of sanitation facilities, temporary electrical connections from the generator to office trailer, and portable water storage units. The mechanical screening device will be erected in a strategic and or central location.

Samples will be collected from the proposed backfill material and analyzed to establish the chemical concentrations and certify the material appropriate for use as clean backfill material. The sample will be analyzed for TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP pesticides, TCLP herbicides, total petroleum hydrocarbons (TPH), and benzene, toluene, ethylbenzene, and xylenes (BTEX). The backfill material will be characterized by comparing to the regulatory criteria for the TCLP results (Table 4-1) and according to 9 VAC 20-80-700(D)(5) which stated that only soil containing less than 50 mg/kg TPH and total BTEX less than 10 mg/kg may be used as clean fill.

Work zones will be established to control the operations of planned material handling efforts.

The JV I will strategically locate high visibility fence and traffic cones to identify traffic routes and lanes for the hauling vehicles.

4.2.4 Erosion and Sediment Control

The need for erosion and sediment protection will be minimal for this project as the site is relatively flat. The existing swales east and west of Site 3 will be specifically identified as "key" locations for stringent erosion controls. The proposed temporary controls for containing and filtering site waters will be 36–in. fabric silt fence and bound hay/straw bales both of which will be secured to ground surfaces with wooden grade stakes. Further information is detailed in the Erosion and Sediment Control Plan (Appendix C).

4.2.5 Spill Prevention

To minimize the potential for spills and or releases from stationary fuel tanks, heavy equipment, and trucks, visual inspections will be performed periodically thorough the work shift for signs of drips, leakage, or stainage on ground surfaces on and below the equipment. A fueling station will be pre-designated in an area that will have the ground surface protected in the event of a leak or spill from overfilling. All fuel staging areas will be placed on geotextile fabric and bermed to prevent leakage to the ground surface.

JV I will provide adequate spill response equipment and materials. Spill response equipment will include absorbent materials, sand, and other spill-containment devices necessary to prevent migration. Other equipment will include construction equipment used in ongoing construction activities, as outlined in the Health and Safety Plan (Appendix B).

All equipment will be tested and maintained as necessary to assure its proper operation in time of emergency. After an emergency, all equipment will be cleaned and ready for its intended use before normal operations resume.

4.3.2 UXO Screening

Trained and experienced UXO technicians will support excavation and screening operations by observing each field process visually. By conducting magnetometer screening and visual screening, the technicians will be able to identify shapes encountered during field operations that could be UXO. Visual and magnetometer screening will occur during the initial excavation and will be repeated prior to the material being placed in the soil screen. Any suspect items deemed as such by the UXO technicians will be individually segregated and uniquely evaluated for its proper disposition. JV I will subcontract theses services. A detailed "UXO Construction Support and Management Plan" is included in Appendix E.

4.3.3 Quantity Verification

JV I will utilize the services of a licensed local surveyor to periodically field verify volumes of material removed. This survey data will be the basis for confirming estimated quantities and serve as verification for invoicing volumes and percent complete. The volume confirmations will also be compared to the actual weight of the materials received at the disposal facility. JV I site management will monitor the disposal weights as compared to corresponding volumes to determine an average conversion factor (CY to tons). As results dictate, excessive weights per CY may require additional gravity dewatering prior to load-out. Dewatering operations will include the stockpiling of material which will allow for evaporation or gravity dewatering. Stockpiling of soils will occur only in those areas which are scheduled for removal. Any liquids from dewatering activities will be allowed to percolate into the ground surface and/or evaporate. Upon completion, an as-built drawing will be submitted with the final closeout report detailing actual removal grades.

4.3.4 Transportation and Disposal

Soilex Corporation of Virginia Beach, Virginia, will be retained as a subcontractor to transport and dispose of the excavated Site 3 materials. Documentation will be provided for each load, with weekly and monthly summaries to support invoiced quantities. Non-hazardous waste manifests will be signed by the ROICC, with a copy provided to Mrs. Valerie Walker.

If UXO materials are recovered, they will be managed according to the Navy's Requirements. An inspection of these pieces will be certified by UXO technicians onsite to determine whether they are live or required inerting. If they are not found to be live, they will be transferred as obliterated material to the Defense Recyclable Materials Office (DRMO).

4.3.5 Confirmation Sampling

Sampling to determine the excavation limits was conducted in March 2003. Fifty-five samples were collected from surface soil, subsurface soil and sediment (upland ditch soil) locations. Analytical results indicated that, with the exception of one surface soil location, concentrations were below the calculated 95% UTL for dredge fill soils, in which Site 3 is located. Based on these results, the Navy, USEPA, and VDEQ accepted these samples as confirmatory samples, with the exception of the one surface soil location. Therefore, only one confirmatory sample will be collected during the Phase II Removal Action. A JV I field technician will obtain one post-excavation sample in the vicinity of the radar tower to be

analyzed for Target Compound List (TCL) SVOCs by Contract Laboratory Program (CLP) method OLM04 and Target Analyte List (TAL) metals and cyanide by CLP method ILM04. Laboratory efforts will include the required quality controls and sample validation. Confirmatory sampling will be conducted at the beginning of mobilization to expedite turnaround and avoid project delays. Once confirmatory sampling indicates a clean demarcation, excavation will commence in this area.

Following receipt of the validated data from the analytical laboratory for the one sample, the results for the COPCs, established in the RI, will be compared to the 95% UTLs (Table 4-2). If the concentrations are below the 95% UTL, the fifty-five existing and one new confirmatory sample locations will define the extent of the removal area. If however, the results indicate COPCs for the one sample remain elevated above the background 95% UTL, surrounding the proposed area of excavation, the following alternative remedial options will be addressed by the SJCA Partnering Team:

- Additional sampling to better define the extent of contamination for removal;
- A combination of risk management along with limited soil removal; and
- Alternative remedial actions will be explored as part of the Feasibility Study for Site 3.

If an alternative is pursued that significantly differs from the NTCRA of record, the remedy will need to be revised and presented to the public prior to implementation.

4.4 Backfill and Restoration

4.4.1 Placement of Backfill

Following receipt of the post-excavation sample result confirming cleanup goals have been achieved (Table 4-1), the JV I will confer with the Navy representative(s) as to the start of backfilling operations. Factors that determine the start of excavation/backfilling operations will include the amount of material removed to date, daily removal rates, weather, and truck traffic (it is important to note that there is limited access for trucks at Site 3). Backfill material will be delivered to the site from a previously sampled offsite source to determine the quality of physical and chemical properties.

Full loads of fill material will be greeted at the entrance to the site by flagmen wearing reflective vests. Each load will be directed to the unloading location for that particular day/shift. Safety cones and or high visibility markers will aid in channeling the truck traffic to the appropriate locations. The flagmen will be responsible for tracking each received load and signing the delivery tickets. A bulldozer will mechanically push and spread the delivered back fill materials. Areas within Site 3 furthest from the main entrance will be covered first. Covering efforts will progress towards the main entrance thus avoiding significant truck delivery traffic from traveling over large areas of recently placed fill material. Compaction will be achieved in lifts with the weight of the bulldozer passing over the placed materials. A field survey crew will confirm in place material volumes.

All backfilled areas will be seeded with an approved mix of seed, nutrients, fertilizer, and mulch, as specified by the ROICC. Temporary erosion-control measures will remain until vegetation is established. JV I and Navy personnel will conduct a site inspection prior to the site's tear-down and demobilization. This inspection will focus on items that have been

performed or will be performed prior to project completion. Items that are incomplete or require further work to meet the project specification will be documented by the designated QC Manager and corrected by the project team within a reasonable time. Once completed, the Navy will be advised in writing and a final inspection will be conducted involving the same personnel to verify that the items in question have been completed.

Portions of the gravel road that bisects Site 3 will be excavated during the removal action. The replacement of those portions of the gravel road will consist of backfill material and be finished with crushed stone recycled from the work zone. The gravel road will be restored to its current condition.

4.4.2 Seeding

Seed and mulch will be applied to all distributed areas within the site limits. A subcontractor will apply the seed, mulch, and nutrients consistent with the native and existing grasses.

4.4.3 Cleanup and Demobilization

Once the final inspection is complete and the work is accepted, JV I will commence demobilizing personnel and equipment. Materials used during the performance of site activities will be removed and or disposed.

4.5 Closeout Documentation

At the conclusion of field activities, JV I will commence preparation of the construction closeout report. This report will summarize all of the project activities. This report will include the following:

- Description of activities completed
- Transportation and Disposal records
- Daily operations and QC reports
- Health and Safety Summaries
- Analytical results and sample locations
- As built drawings
- Tables and figures depicted relevant data
- Remedial Action Closeout Report (RACR)

Electronic versions of each deliverable will be submitted to LANTDIV in hardcopy and on a CD-ROM containing native files for each draft submittal and Adobe® pdf files of each final submittal. Final versions will include the draft document, comments, response to comments, final document, final regulatory concurrence, and other relevant information that should be included in the administrative record file.

Table 4-1
Regulatory Levels for Waste and Fill Characterization
IRA (Phase II) at Site 3
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name	Regulatory Levels
TCLP VOCs (UG/L)	
1,1-Dichloroethene	700
1,2-Dichloroethane	500
2-Butanone (Methyl Ethyl Ketone)	200,000
Benzene	500
Carbon Tetrachloride	500
Chlorobenzene	100,000
Chloroform	6,000
Tetrachloroethene	700
Trichloroethene	500
Vinyl Chloride	200
TCLP SVOCs (UG/L)	
1,4-Dichlorobenzene	7,500
2,4,5-Trichlorophenol	400,000
2,4,6-Trichlorophenol	2,000
2,4-Dinitrotoluene	130
2-Methylphenol (o-cresol)	200,000
3+4-Methylphenols (m+p-cresol)	200,000
Hexachlorobenzene	130
Hexachlorobutadiene	500
Hexachloroethane	3,000
Nitrobenzene	2,000
Pentachlorophenol	100,000
Pyridine	5,000
TCLP Pesticides (UG/L)	
Chlordane	30
Endrin	20
gamma-BHC (Lindane)	400
Heptachlor	8
Methoxychlor	10,000
Toxaphene	500
TCLP Herbicides (UG/L)	
2,4,5-TP (SILVEX)	1,000
2,4-D	10,000
TCLP Metals (UG/L)	
Arsenic	5,000
Barium	100,000
Cadmium	1,000
Chromium	5,000
Lead	5,000
Mercury	200
Selenium	100
Silver	5,000
Corrosivity (as pH)	12.5
Ignitability (degrees F)	140
Reactivity	*
TPH (MG/KG)	
TPH-diesel range	50
TPH-gas range	50
BTEX (MG/KG)	10

*-Waste is reactive if it readily explodes, undergoes violent reactions, or reacts to release toxic gases or fumes.

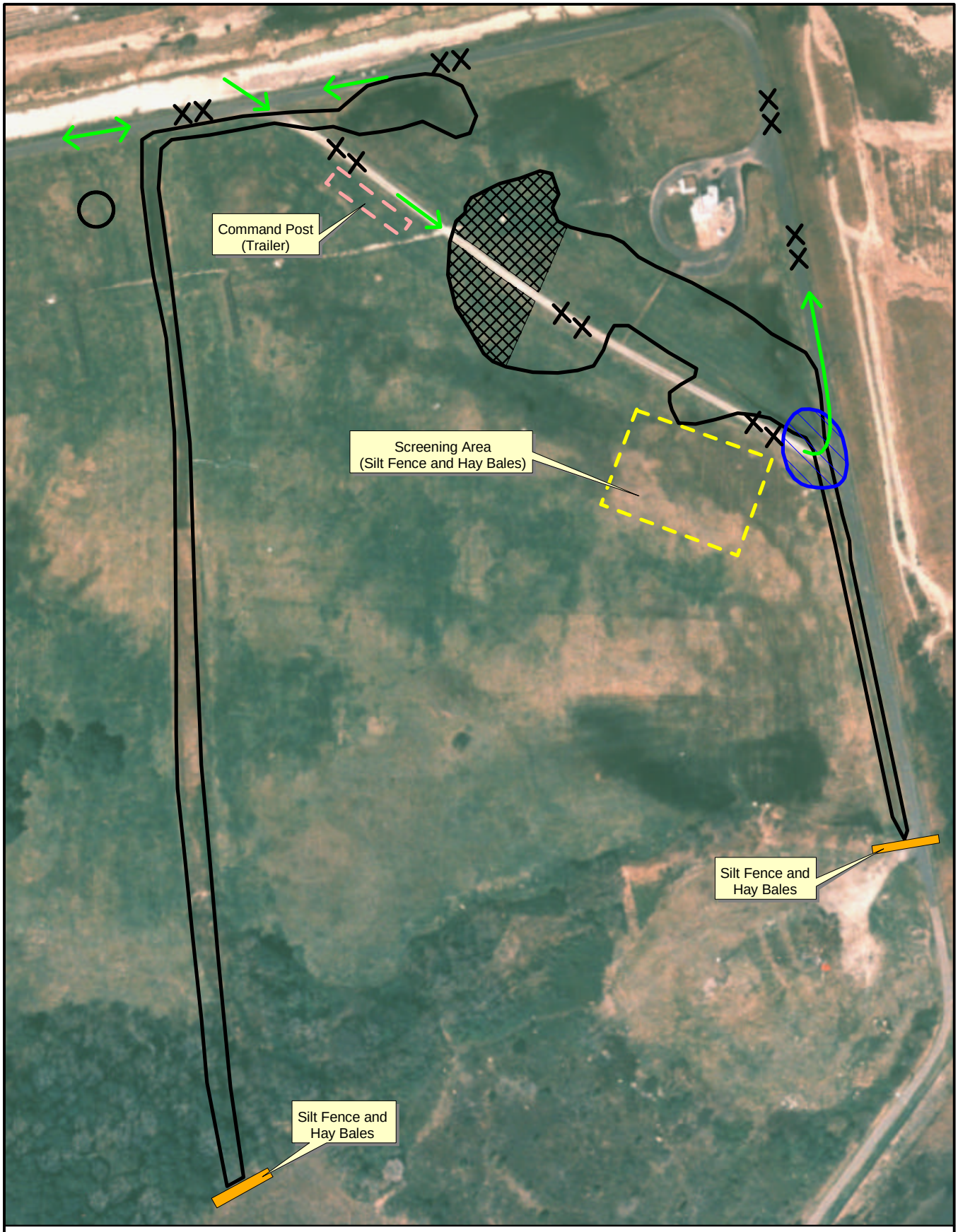
Note: The backfill material will be characterized by comparing to the regulatory criteria for TCLP and according to 9 VAC 20-80-700(D)(5) which stated that only soil containing less than 50 mg/kg TPH and total BTEX less than 10 mg/kg may be used as clean fill.

Table 4-1
Background UTLs for Dredge Fill
IRA (Phase II) at Site 3
St. Juliens Creek Annex
Chesapeake, Virginia

Chemical Name (COPC)	95% Background UTLs for Dredge Fill (Surface Soil)
Metals (MG/KG)	
Arsenic	24
Barium	98
Chromium	45
Copper	58
Iron	45,805
Lead	147
Zinc	137

Note: The chemical names listed are COPCs established in the RI (CH2M HILL, 2003).

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

- Area Removed During 2002 Removal Action
- Site 3 Removal Action
- Command Post
- Screening Area
- Haul Road
- Truck Route
- Hay Bale / Silt Fence
- Crushed Stone Exit Ramp

N

0 100 200 Feet

Figure 4-1
Site 3 Work Zone
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

Appendix A
Quality Control Plan

Quality Control Plan
Interim Remedial Action (Phase II)
at Site 3
St. Juliens Creek Annex
Chesapeake, Virginia

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No. N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Virginia Beach, Virginia

Contents

Quality Control Plan ..... **v**

1 Introduction **1-1**
1.1 Site Background 1-1
1.2 Previous Investigations 1-5
1.2.1 Site Specific Investigations 1-5
1.2.2 Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA) 1-5
1.2.3 Engineering Evaluation/Cost Analysis (EE/CA)/Action Memorandum 1-5
1.2.4 Phase I Interim Removal Action (IRA) – Site 3 1-9
1.2.5 Site 3 Removal Delineation 1-9

2 Quality Control Plan **2-1**
2.1 Quality Control Organization 2-1
2.2 Names and Qualifications 2-1
2.3 Duties, Responsibilities, and Authorities 2-1
2.4 Outside Organizations 2-2
2.5 Appointment Letters 2-2
2.6 Submittal Procedures and Initial Submittal Register 2-2
2.7 Testing Laboratory Information 2-2
2.8 Testing Plan & Log 2-3
2.9 Procedures to Complete Rework Items 2-3
2.10 Documentation Procedures 2-3
2.11 QC Inspection Planning and Performance 2-3

Exhibits

1-A Personnel Matrix

4-A Approved Consultant and Subcontractor List

6-A Submittal Register
6-B List of Personnel Authorized to Review and Certify Submittals

8-A Test Plan and Log

11-A Quality Control Inspection Plan

Figures

1-1 Base Location Map 1-3
1-2 Site Location Map 1-7

2-1 Organization Chart 2-4
2-2 Site QC Representative Profile 2-5
2-3 Site QC Representative Letter of Appointment 2-7

Quality Control Plan

AGVIQ-CH2M HILL Joint Venture I (JV I) will provide and maintain an effective Quality Control (QC) Program. This program will be performed in accordance with the approved Quality Control plan as developed to specifically respond to contract and task order requirements. JV I will perform the inspections and tests required to ensure that materials, workmanship, and construction conform to drawings, specifications, and contract requirements.

Quality Control is not to be considered a person or an organization, but a concept to perform in such a manner that the end results and efforts meet established criterion, primarily the customer needs.

It should be noted by all JV I associates that the documentation requirements of JV I procedures, plans, and the task order specifications are considered equally as important as the end product.

Our livelihood as a Team depends on how well we satisfy our customer, and to accomplish this requires our diligence and attention to detail by all contributors.

SECTION 1

Introduction

AGVIQ-CH2M HILL Joint Venture I (JV I) has been contracted by the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command to provide excavation and mechanical screening of Site 3 soils, waste, and sediment at St. Juliens Creek Annex (SJCA) located in Chesapeake, Virginia. A detailed description of the work activities for this task order are presented in the Work Plan (WP). This site specific Quality Control Plan (QCP) describes the QC procedures to be followed during the execution of the work.

1.1 Site Background

The SJCA facility is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, located in southeastern Virginia. The facility covers approximately 490 acres (Figure 1-1).

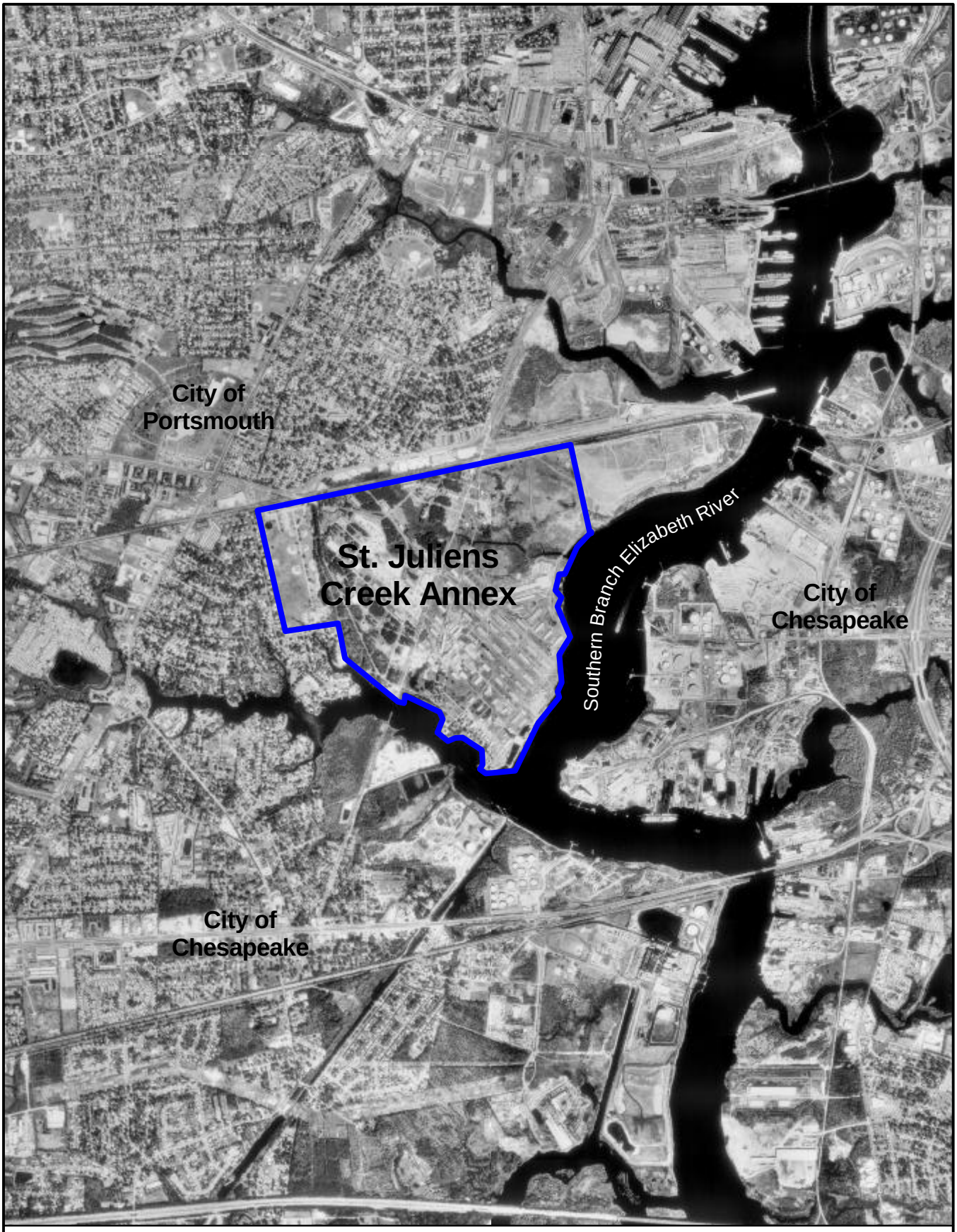
The facility is bordered to the north by the Norfolk and Western Railroad, the City of Portsmouth, and residential areas; to the west by residential areas; to the south by St. Juliens Creek; and to the east by the Southern Branch of the Elizabeth River. Most of the surrounding areas are developed and include residences, schools, recreational area, and shipping facilities for several large industries.

St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. In the past, operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. In addition, the Annex has been involved in specific ordnance operations and processes including those involving black powder operations, smokeless powder operations, projectile loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. All ordnance related activities at SJCA have been discontinued.

St. Juliens Creek Annex has also been involved in non-ordnance operations, including degreasing operations, paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash rack operations, potable and salt water fire protection systems, and fire training operations. Many of these operations have been discontinued, such as locomotive maintenance and printing.

Activity at SJCA has decreased in recent years. The current primary mission of SJCA is to provide a radar testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Shore Intermediate Maintenance Activity (SIMA), a radar testing facility, and a cryogenics school for tenant naval commands.

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

St. Juliens Creek Annex

N

0 2000 4000 Feet

Figure 1-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

Back of figure 1-1

Materials stored at SJCA have included oil, ordnance materials, non-ordnance chemicals, and disaster preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

1.2 Previous Investigations

Several previous investigations have been conducted at Site 3 (Figure 1-2). The following base-wide documents included investigations of Site 3:

- Initial Assessment Study (IAS) in 1981
- Preliminary Assessment (PA) in 1983
- Phase II RCRA Facility Assessment (RFA) in 1989
- Relative Risk Ranking Data Collection (RRR) in 1996

The previous base-wide investigations recommended further evaluation of Site 3.

1.2.1 Site Specific Investigations

Several investigations have been conducted at Site 3 to determine the extent of contamination, the fate and transport of compounds of concern and to determine the potential risk to human health and the environment. Additionally, an interim removal action was conducted, based on the results of these investigations, utilizing a selected removal alternative. The following sections describe the various documents and their findings.

1.2.2 Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA)

An RI/HHRA/ERA Report were completed for Site 3 in March 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, waste delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, and surface water samples. Debris and burnt/stained soils were visually identified within 30 inches (in.) of the ground surface at Site 3.

The RI identified constituents of potential concern at Site 3 as compounds that pose a potential risk based on human health and ecological risk assessments and were present at concentrations above the 95 percent upper tolerance limits (UTLs). Statistical comparison of site and background data and risk management considerations were used to define the potential site risks. These studies concluded that chemicals posing a potential risk in site 3 soil and sediment were inorganics, pesticides, and PAHs.

1.2.3 Engineering Evaluation/Cost Analysis (EE/CA)/Action Memorandum

Based upon the findings of the RI/HHRA/ERA, the Navy conducted an Engineering Evaluation/Cost Analysis (EE/CA) that explored three alternatives for addressing the non-time-critical removal action (NTCRA) at Site 3 (CH2M HILL, 2002). Criteria specified in the National Contingency Plan (NCP) were utilized to select site remedy (i.e. cost, effectiveness, implementability of each alternative, etc.) The selected alternative involved the removal of waste, soil, and upland ditch soil/sediment at Site 3 (Alternative 3) posing potential risk.

This alternative was selected since it best achieved the removal of potential risk at the site, thus providing the greatest protection of human health and the environment. The Navy signed an Action Memorandum in 2002, implementing the selected remedy (removal) specified in the EE/CA.

Based on the existing surface soil data, the SJCA Tier I Partnering Team agreed that the final removal in the EE/CA would include the waste area, the areas around sample locations where risk drivers were identified, an isolated hotspot, and sediment.

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

LEGEND

- Site Locations
- Roads
- Railroads
- Activity Boundary

N

500 0 500 1000 Feet

Figure 1-2
Location of Site 3
within St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

Back of figure 1-2

1.2.4 Phase I Interim Removal Action (IRA) – Site 3

In August and September of 2002, the Navy conducted a Phase I IRA at Site 3 that included excavation of visible burnt/stained soil and debris as well as surrounding material posing a potential risk to human health and the environment, waste characterization (including unexploded ordnance [UXO] screening and removal) for disposal, non-hazardous disposal of waste debris in a local landfill, and site restoration. The extent of the area removed included 3,300 CY of waste and soil. The remaining wastes left in place following Phase I were to be removed during a future action. A site closeout report and removal summary report detailed activities conducted under the Phase I IRA (OHM/Shaw, 2003 and CH2M HILL, 2003).

1.2.5 Site 3 Removal Delineation

In March 2003, CH2M HILL conducted an investigation to delineate the remaining soil, waste, and upland ditch soil (referred to in the RI as sediment) requiring excavation at Site 3 by obtaining samples from 55 locations to delineate the horizontal and vertical extent of removal required for Phase II removal actions. The Phase II removal will be conducted up to and through these sample locations.

The results of the analysis were statistically compared to established background concentrations to determine if clean closure of the site could be achieved. Based on the analysis, limits of required waste/soil removal were defined in all but one limited area. Therefore, a limited number of confirmatory samples (one) will be collected during the Phase II removal action.

SECTION 2

Quality Control Plan

2.1 Quality Control Organization

The QC organization is depicted in the Organizational Chart, Figure 2-1. Other positions are reflected to demonstrate organizational interface and lines of communication. Within the structure, the QC organization may administratively report to the project Manager, but will functionally report to the Program Manager for all matters involving quality. For small or routine projects, the Site QC Representative may perform the duties of project superintendent or project engineer, providing this approach is acceptable to the Contracting officer and or ROICC representative.

The Site QC Representative will prepare and maintain the personnel matrix, Exhibit 1-A, which shows each section of the task Order specifications with identification of who will review and approve submittals, who will perform and document the three phases of control, and who will perform and document testing. This matrix should be completed prior to site mobilization, and should be maintained current by the Site QC Representative.

2.2 Names and Qualifications

JV I will provide only qualified QC staff members that possess familiarity with the task at hand.

2.3 Duties, Responsibilities, and Authorities

The Site QC Representative shall be responsible for enforcing the implementation of the quality control program for on site and off site activities. General duties shall include, but not be limited to attending the Coordination and Mutual Understanding meeting, conducting the regularly scheduled QC meetings, implementing the three phase control process for each definable feature of work, performing QC inspection and test verification activities, reviewing and certifying submittals, identifying and verifying the correction of rework items, ensuring that all required sampling and tests are performed, and preparing QC documentation as required by this plan. The QC Representative Profile is provided as Figure 2-2.

Specifically, the QC Representative shall:

- Have no job related responsibilities that interfere with the QC function
- Be on site as warranted by the progress of work, with authority to take action as necessary to ensure conformance with the contract requirements.
- Has the authority to immediately stop any segments of work, which do not comply with the contract plans and specifications, and directs the removal and replacement of any defective work.

- Conduct inspection of work performed for compliance with plans and specifications
- Certify that all materials and equipment delivered/installed comply with contract plans and specifications.
- Supervise and coordinate the inspection and tests made by the members of the QC organization, including subcontractors.
- Maintain a copy of the approved QC plan on file at the project location, complete with current and approved revisions of submittals. Maintain a current QC submittal register.
- Ensure that the QC organization is adequately staffed with qualified personnel to perform all the detailed inspections and testing specified in the plans and specifications.
- Coordinate and conduct (frequency determined by ROICC) QC meetings with Navy personnel. The ROICC NTR, RPM and CNRMA representative should be invited to attend all project meetings.

2.4 Outside Organizations

A list for identifying outside organizations such as architectural and consulting engineering firms, and subcontractors employed by JV I for work under this task order is provided in Exhibit 4-A. Once procurement commitments have been established, the list will be completed, maintained current and available for review.

2.5 Appointment Letters

The Site QC Representative appointment letter is provided as Figure 2-2. Similar letters will be provided when necessary to describe the duties and authorities assigned as QC alternates.

2.6 Submittal Procedures and Initial Submittal Register

The initial Submittal Register is provided as Exhibit 6-A. The register will be maintained current and complete by the Site QC Representative in accordance with the contract specification.

Personnel authorized to review and certify submittals other than the Site QC Representative are identified on Exhibit 6-B.

2.7 Testing Laboratory Information

All labs that will be performing analytical services in support of this task order shall comply with the *Navy Installation Restoration Chemical Data Quality Manual (IR CDQM)*, Interim Guidance Document by the Naval Facilities Engineering Service Center (NFESC), dated September, 1999.

2.8 Testing Plan & Log

A testing plan and log, Exhibit 8-A, shall be completed and maintained current by the Site QC Manager/Representative. Instructions are provided in the Program QC Plan and the contract specifications.

2.9 Procedures to Complete Rework Items

The Site QC Manager/Representatives shall maintain a list of work that does not comply with the contract, identifying what items need to be reworked, the date the item was originally discovered, and the date the item was corrected. There is no requirement to report a rework item to the Navy that is corrected the same day it is discovered. The Rework Items List is provided in the contract specification. This list shall also contain those rework items identified by the ROICC.

2.10 Documentation Procedures

The Site QC Manager/Representative shall be responsible for delivering the following documentation:

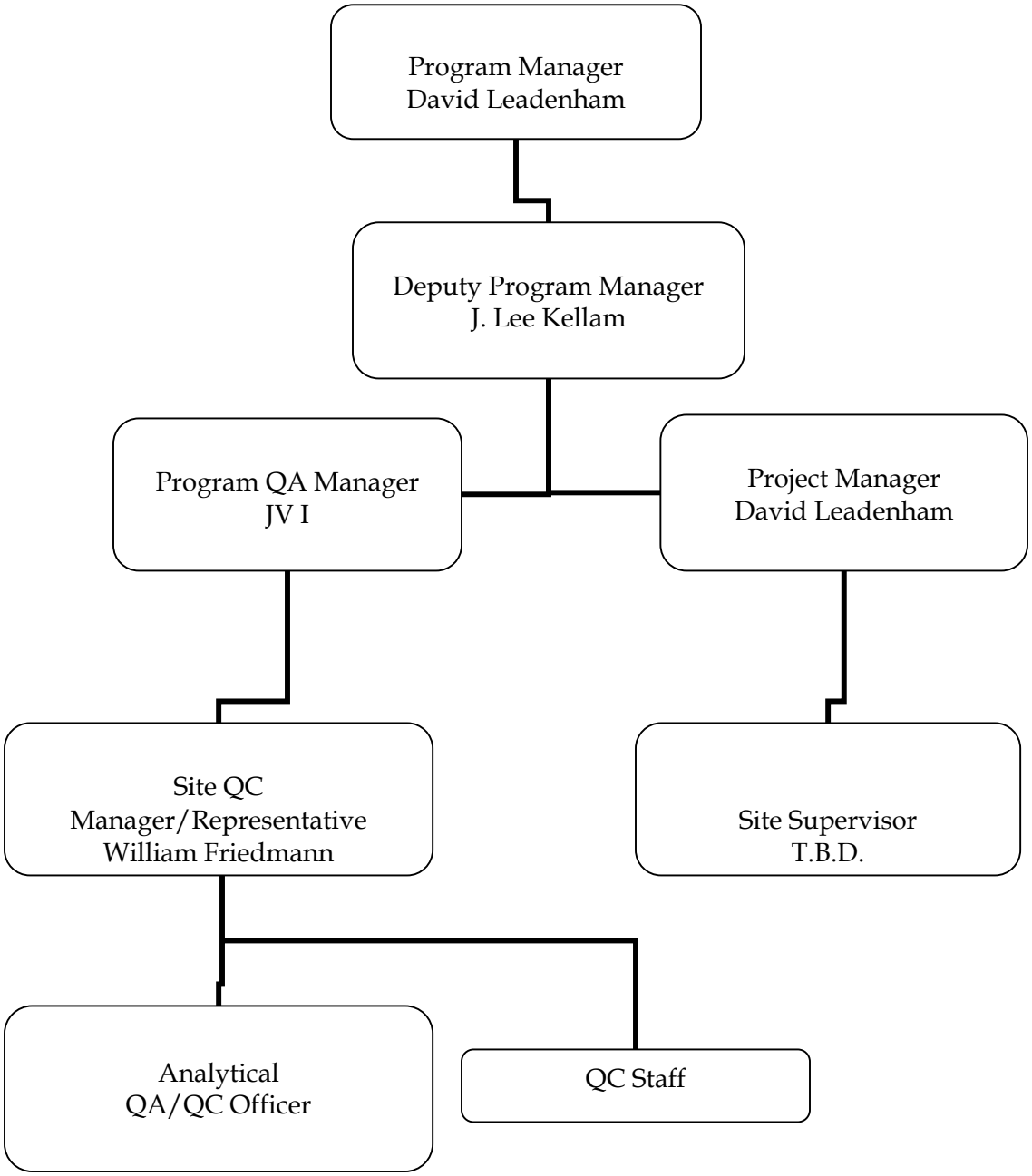
- **QC Meeting Minutes –** The Site QC Manager/Representative shall document QC meetings by delivering copies of the minutes to the ROICC NTR, RPM, and CNRMA representative within 3 calendar days after each QC meeting. The submittals shall comply with the basic contract.
- **Test Results Summary Report –** A summary report of field tests and laboratory analytical results shall be submitted to the ROICC NTR, RPM, and CNRMA representative within 30 days after laboratory receipt of samples and in accordance with the basic contract. A separate report shall be required for each set of analytical data.
- **Contractor Production Report (CPR) –** A CPR shall be prepared and submitted daily to the ROICC NTR in accordance with the basic contract.
- **QC Report –** The QC Report shall be submitted by the Site QC Manager/Representative to the ROICC NTR every day work is performed, material is delivered, direction is pending, or a labor force is present in accordance with the basic contract.
- **Rework Items List –** The Site QC Manager/Representative shall deliver a copy of the Rework Items List to the ROICC NTR on a monthly basis in accordance with the basic contract.

2.11 QC Inspection Planning and Performance

QC inspection activities will be performed by the site QC Manager/Representative and documented in accordance with the requirements of the program. An inspection plan, Exhibit 11-A will be maintained and completed as the work progresses. A checklist will be developed and completed for each definable feature of work.

The Site QC Manager/Representative shall perform the three phases of control to ensure that work complies with contract requirements. The three phases of control shall adequately cover both on-site and off-site activity for each definable feature of work.

FIGURE 2-1
JV I
QC Organizational Chart



William J. Friedmann, Hydrogeologist

Relevant Experience
Mr. Friedmann is responsible for conducting groundwater investigations for hazardous and solid waste facilities. He has managed and participated in groundwater monitoring plans, groundwater sampling, and water quality data analysis, interpretation, and statistical evaluations. Mr. Friedmann has conducted water supply studies and well field analyses for federal, municipal and private clients. He has prepared groundwater withdrawal permit applications in accordance with Virginia Regulations for Groundwater Management Areas. Mr. Friedmann conducts field investigations and prepares groundwater investigation reports for sites under Virginia's VRP.

His project experience includes the following:

Camp Peary – Groundwater Sampling and Monitoring, Armed Forces Experimental Training Activity Landfill (Williamsburg, Virginia). Conducted groundwater sampling episodes and the installation of monitoring wells. Responsible for the management of semiannual groundwater monitoring and reporting. Assessment Monitoring under VSWMR was initiated in response to statistically significant increases in metal concentrations. Demonstrated statistical increases were due to sample turbidity and not a contaminant release from the landfill. Installation and sampling of monitoring wells including low flow purging and sampling techniques that effectively reduced sample turbidity and demonstrated the false positive statistical increase in metals in groundwater. Performed data analysis and statistical evaluations of semiannual Assessment Groundwater Monitoring data.

Remedial Investigation, Confidential Client (Petersburg, Virginia). Led a Virginia Voluntary Remediation Program (VRP) investigation. Included the installation of monitoring well inside occupied buildings, aquifer testing, sampling and analysis, data evaluation and interpretation, and preparation of document to the state VDEQ.

Groundwater Monitoring Wells, Durham Municipal Landfill (Durham, North Carolina). For the City of Durham Municipal Landfill, installed and sampled groundwater monitoring wells. Conducted semiannual groundwater monitoring, including sampling, analysis, and interpretation of groundwater quality data. Statistical evaluations included using Wilcox Rank Sums, Prediction Limits and Confidence Limits. Assisted in preparation of semiannual Assessment Groundwater Monitoring reports. Installation of monitoring wells as part of a landfill expansion investigation.

Asbestos Inspection\Abatement, Virginia Department of Transportation (Various locations, Virginia). Conducted inspections of private residences and VDOT facilities for the presence\absence of asbestos containing building material (ACBM). Preparation of reports with recommendations for the proper control or removal of ACBM. Reviewed abatement work plans and cost estimates. Supervised the safe removal of ACBM from VDOT facilities, including collection of air samples for final clearance and reoccupancy and visual inspection abated areas. Preparation and review of final removal reports to VDOT.

Years of Experience
13

Education
BS, Geology, 1989 – Old Dominion University

Registration
Professional Geologist – Virginia, North Carolina

Distinguishing Qualifications
- Hazardous waste/contaminated site assessment and characterization
- Groundwater monitoring, sampling, and treatment
- Virginia Voluntary Remediation Program (VRP) closures
- RCRA closure planning and implementation

FIGURE 2-3
Site QC Representative Appointment Letter

JV I
4663 Haygood Rd. Suite #208
Virginia Beach, VA 23452

RE: Site QC Manager

Dear (Name):

This letter will serve as your appointment as the Site Quality Control Manager on the referenced project and will also clarify your duties and authority in this position. In this position, you will be authorized to use available resources to satisfy all applicable requirements of the Program and Task Order Quality Control Plan.

This authorization specifically gives you the authority to direct removal and replacement or correction of nonconforming materials or work and stop work authority when continuation would be unsafe to personnel, harmful to the environment, or result in a significant degradation of quality.

You will be expected to work closely with the project Manager and other project personnel, but you will not be directly responsible to anyone but myself for resolution of quality issues when working in the capacity of Quality Control Manager.

If you have any questions in this matter, please call me.

Sincerely,

Manager of Quality Assurance/Quality Control
JV I

Exhibits

EXHIBIT 4-A
Approved Consultant & Subcontractor List

Company Name & Address:	Description of Services Provided:
TBD	TBD

EXHIBIT 6-B
List of Personnel Authorized to Review & Certify Submittals

Specification Section:	Submittal Type:	Authorized Personnel:

EXHIBIT 8-A
Testing Plan and Log

Contract Number			**Project Title and Location**								**Contractor**	
Specification Section and Paragraph Number	Item of Work	Test Required	Accredited/ Approved Lab		Sampled By:	Tested By:	Location of Test		Frequency	Date Complete	Date Forwarded to Contractor Office	Remarks
			Yes	No			On-site	Off-site				

EXHIBIT 11-A
Quality Control Inspection Plan

Specification Section	Definable Feature of Work	Activity Number*	Control Check Verification		
			Preparatory Phase Checklist/Report No.	Initial Phase Checklist/Report No.	Follow-up Phase Checklist/Report No.

* Includes schedule date, if a CPM network is invoked.

EXHIBIT 6-A
Submittal Register

Task Order: 005 **Project Number: AV03J08 & 182670** **St. Juliens Creek Annex, Site 3, Chesapeake, VA** **Contractor: JV I**

Submittal No.	Spec Section No.	SD No and Type and Submittal	Spec Para No.	Classification Approval by Contracting officer	Government or A/E Reviewer	Transmittal control number	Planned Submittal Date	Contractor Action			Approving Authority Action				Contractor	Remarks
								Action Code	Date of Action	Date Forward to Approved Authority Date Record from Contractor	Date Forwarded to other Reviewer	Date record from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Record from approved Authority	
(a)	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	Work Plan				G		10/31/2003									
	QC Plan				G		10/31/2003									
	Health & Safety Plan				G		10/31/2003									
	Erosion Sediment Control Plan				G		10/31/2003									
	Environmental Protection Plan				G		10/31/2003									
	As-built Records				G		10/31/2003									Project completion
	Status Reports				A/E		Every 2 Weeks									See TO/Monthly
	QC Meeting Minutes				A/E		Every 2 Weeks									
	Test Results Summary Report				A/E		11/03/2003									
	Contractor Production Report				A/E		Every 2 Weeks									
	QC Reports				A/E		Every 2 Weeks									
	Rework Items List				A/E		As Needed									
	Contractor Close-out Report				A/E		06/10/2004									Project completion
	Testing Laboratory Qualifications				A/E		10/31/2003									
	Testing Laboratory Qualifications				A/E		10/31/2003									
	Backfill & Fill Material				A/E		11/2003									
	Non-Hazardous Waste Manifests				A/E		As Needed									
	Confirmatory Sample Results				A/E		11/03/2003									

Note: Dates of action will be filled in following the comment review period and AROICC Pre-construction meeting.

Action Codes: (others may be prescribed by Transmittal Form)

NR = Not Reviewed AN = Approved as Noted

A = Approved RR = Disapproved, Revise and Submit

Appendix B
Health and Safety Plan

Health and Safety Plan
for
St. Juliens Creek Annex

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No: N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICI
CH2M HILL
JOINT VENTU

Reviewed by:

_____

David Leadenham

Contents

1 Introduction 1-1
1.1 Base Background 1-1
1.2 Site 3 1-2
1.3 Site Background 1-2
1.4 Previous Remedial Investigation Results 1-3
1.5 Project Safety Responsibilities 1-3
1.6 Key Safety Personnel 1-3

2 Activity Hazard Analysis 2-1
2.1 Chemical Hazards 2-1
2.2 Hazard Communication 2-4
2.2.1 Container Labeling 2-4
2.2.2 Material Safety Data Sheets (MSDSs) 2-4
2.2.3 Employee Information and Training 2-4
2.3 Physical Hazards 2-5
2.4 Activity Hazard Analyses 2-5

3 Work and Support Areas 3-1

4 Protective Equipment 4-1
4.1 Anticipated Protection Levels 4-1
4.2 Protection Level Descriptions 4-1
4.2.1 Level D 4-2
4.2.2 Modified Level D 4-2
4.2.3 Level C 4-2
4.3 Air Purifying Respirators 4-2

5 Decontamination Procedures 5-1
5.1 Personnel Decontamination 5-1
5.1.1 Suspected Contamination 5-1
5.1.2 Personal Hygiene 5-1
5.2 Equipment Decontamination 5-1
5.3 Disposal 5-1

6 Air Monitoring 6-1
6.1 Confined Space Air Monitoring 6-1
6.1.1 Direct Reading Air Monitoring 6-1
6.2 Instrumentation 6-2
6.2.1 Real-Time Aerosol Monitor (Miniram Model PDM-3 and Model Pr100 Data Ram) 6-2
6.2.2 Photoionization Detector (PID) 6-2
6.3 Air Monitoring Log 6-3
6.4 Calibration Requirements 6-3
6.5 Air Monitoring Results 6-3

7 Emergency Response 7-1
7.1 Pre-emergency Planning 7-1
7.2 Emergency Recognition and Prevention 7-2
7.3 Personnel Roles, Lines of Authority, and Communications 7-4

7.3.1 Responsibilities and Duties 7-4
7.3.2 On-Site Emergency Coordinator Duties 7-4
7.4 Safe Distances and Places of Refuge 7-7
7.5 Evacuation Routes and Procedures 7-7
7.5.1 Evacuation Signals and Routes 7-8
7.5.2 Evacuation Procedures 7-8
7.6 Emergency Spill Response Procedures and Equipment 7-9
7.6.1 Notification Procedures 7-9
7.6.2 Procedure for Containing/Collecting Spills 7-9
7.6.3 Emergency Response Equipment 7-10
7.6.4 Emergency Spill Response Clean-Up Materials and Equipment 7-11
7.7 Emergency Response Contingency Plan 7-11
7.7.1 Medical Emergency Contingency Measures 7-11
7.7.2 Fire Contingency Measures 7-14
7.7.3 Hazardous Weather Contingency Measures 7-15
7.7.4 Spill/Release Contingency Measures 7-15

8 Training Requirements 8-1

9 Medical Surveillance Program 9-1

Appendixes

A Activity Hazard Analyses
B Site-Specific Accident Prevention Plan
C Hurricane Preparedness Plan

Figures

1-1 Base Location Map
1-2 Site Location Map
7-1 Emergency Coordinator Organization Chart
7-2 Hospital Route Map

SECTION 1

Introduction

AGVIQ-CH2M HILL Joint Venture I (JV I) has been contracted by the United States Navy, Atlantic Division, Naval Facilities Engineering Command (LANTDIV NAVFACENGCOM) to provide environmental remediation services at the St. Juliens Creek Annex (SJCA) for the Phase II interim remedial action (IRA) Site 3. This work will be performed under the terms and conditions of our existing contract, number N62470-03-D-4401, Task Order 005.

1.1 Base Background

The SJCA facility is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, located in southeastern Virginia (Figure 1-1). The facility covers approximately 490 acres.

The facility is bordered to the north by the Norfolk and Western Railroad, the City of Portsmouth, and residential areas; to the west by residential areas; to the south by St. Juliens Creek; and to the east by the Southern Branch of the Elizabeth River (Figure 1-2). Most of the surrounding areas are developed and include residences, schools, recreational area, and shipping facilities for several large industries.

St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. In the past, operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. In addition, the Annex has been involved in specific ordnance operations in processes including those involving black powder operations, smokeless powder operations, projectile loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. All ordnance related activities at SJCA have been discontinued.

St. Juliens Creek Annex has also been involved in non-ordnance operations, including degreasing operations, paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash rack operations, potable and salt water fire protection systems, and fire training operations. Many of these operations have been discontinued, such as locomotive maintenance and printing.

Activity at SJCA has decreased in recent years. The current primary mission of SJCA is to provide a radar testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Shore Intermediate Maintenance Activity (SIMA), a radar testing facility, and a cryogenics school for tenant naval commands.

Materials stored at SJCA have included oil, ordnance materials, non-ordnance chemicals, and disaster preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

1.2 Site 3

Site 3 is a former waste disposal area that covers approximately 2.1 acres in the Annex's northeastern corner and is accessible by way of a patrol road. The site is on the dredge-fill material that reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. In earlier documents, Site 3 was referred to as "Dump C" and the aerial extent of Site 3 was initially reported to be about 10 acres.

Site 3 was originally a mudflat where refuse was allowed to burn; the ash was then used to fill the area. Operations began in 1940 and continued until 1970, prior to implementation of the Resource Conservation and Recovery Act (RCRA). After operations ceased at Site 3, the area was graded level and covered with grass (CDM, 1998). Review of historical aerial photographs, interpreted by the Environmental Photographic Interpretation Center (EPIC), indicate that the site and much of the adjacent area had been used for placement of dredge spoil material prior to use as a disposal area (USEPA, 1995).

Refuse disposed at Site 3 included limited process waste and mixed municipal waste. Prior to burning, the total volume of waste disposed was estimated to be about 27,778 cubic yards (CY). Salvageable materials were removed from the site each day, and the site was bulldozed once every 2 weeks for compaction and leveling (CH2M HILL, 2003).

Two pits at Site 3 were reportedly used for disposal of oil and oily sludge, as well as for periodically burning. The locations of the waste disposal pit and waste disposal area were outlined based on aerial photographs taken in 1958, 1961, 1964, and 1970 and interpreted by USEPA (USEPA, 1995). As identified in the photographs, the disposal pits were located along the north side of the dirt road that crosses the site. USEPA also interpreted ground scarring along the road to be possible waste disposal areas (CDM, 1998).

A Waste Delineation Investigation was conducted in June 2001 to determine the extent of waste at Site 3. An interview was conducted on December 18, 2001 with former SJCA employees. The interviews and intrusive investigations conducted as part of the 2001 RI showed that the extent of waste at Site 3 was substantially smaller than previously reported and the site was not an established landfill. As a result, the SJCA Partnering Team reclassified the site as a waste disposal area (CH2M HILL, 2003).

AGVIQ-CH2M HILL Joint Venture I (JV I) has been contracted by the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command to provide excavation and mechanical screening of Site 3 soils at St. Juliens Creek Annex (SJCA) located in Chesapeake, Virginia. A detailed description of the work activities for this task order are presented in the Work Plan (WP). This site specific Quality Control Plan (QCP) describes the QC procedures to be followed during the execution of the work.

1.3 Site Background

SJCA is a 490 acre parcel of land, owned by the Navy, and is located in the City of Chesapeake, Virginia. It is situated at the intersect of St. Juliens Creek and the Southern Branch of the Elizabeth River. Historically, the property has provided various support functions to the Norfolk Naval Shipyard including storage, staging, and landfill disposal.

1.4 Previous Remedial Investigation Results

Recent removal actions at SJCA were associated with the excavation and screening of site three and other Site soils. Other investigatory efforts conducted previously included:

- Engineering Evaluation/Cost Analysis
- Waste Delineation Investigation
- Remedial Investigation Personnel and Management

The Corporate Operations Manager (COM), Project Manager (PM), Site Safety Officer (SSO), Certified Industrial Hygienist (CIH) are responsible for formulating and enforcing health and safety requirements, and for implementing this HASP. The following summarizes the health and safety responsibilities of the site management.

1.5 Project Safety Responsibilities

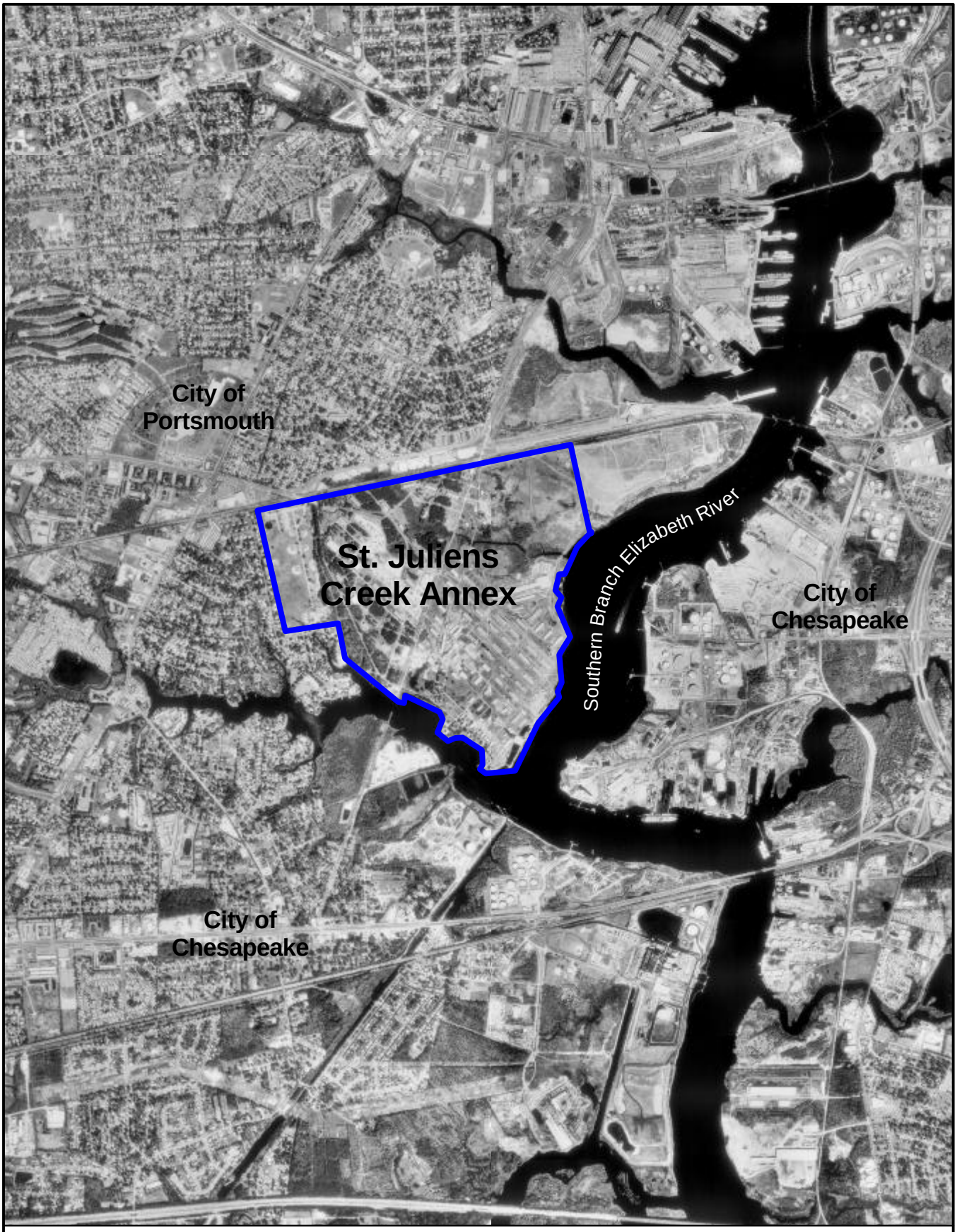
The PM has the overall responsibility for this project and will assure that the requirements of the contract are attained in a manner consistent with this HASP and other contract specific requirements. The PM will coordinate with the SSO to assure that the work is completed in a manner consistent with the HASP. The SSO will be the main contact in any on-site emergency situation and will insure off-site emergency agencies have been contacted prior to the start of work. The COM and CIH are responsible for formulating and reviewing the HASP and ensuring that the HASP is complete accurate. The COM and CIH also provide technical and administrative support for the SJCA Health and Safety Program and will be available for consultation when required. Each employee is responsible for personal safety as well as the safety of others in the work area.

1.6 Key Safety Personnel

The following individuals share responsibility for health and safety at the site:

Project Manager	David Leadenham 757-318-9420
Project Superintendent/Site Safety Officer	Scott Hendershot 757-544-6965
Quality Control Representative	William Friedmann 757-460-3734 x 19
Program Health and Safety Managers	
CH2M HILL	Richard Rathnow 865-483-9032
AGVIQ	Troy Izatt 907-365-6182

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

St. Juliens Creek Annex

N

0 2000 4000 Feet

Figure 1-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

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

LEGEND

- Site Locations
- Roads
- Railroads
- Activity Boundary

N

500 0 500 1000 Feet

Figure 1-2
Location of Site 3
within St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

SECTION 2

Activity Hazard Analysis

This section outlines the potential chemical and physical hazards, which workers may be exposed to during work on this project. The assessment of hazards in this section is based on the information provided in the work plan. Some of the anticipated hazards would include heavy equipment operations, high ambient temperature, wild animals, and insects. A list of chemicals, which may be brought to the site for which an MSDS is necessary, is included will be in the site trailer during the removal activities.

2.1 Chemical Hazards

Work activities involve potential exposure to petroleum hydrocarbons, and metals. Exposure to these chemicals may occur during soil stabilization and/or soil load out activities. Exposure hazards and appropriate protection will be addressed as part of the JV I Hazard Communication Program HS060. The table below lists significant contaminants identified at the site:

Chemical	Exposure Routes	PEL	Health Hazards
PAHs [e.g., Benzo(a) pyrene]	Skin, eye, inhalation, ingestion	0.2 mg/m^3	An Animal Carcinogen, probable human carcinogen; a nasal, respiratory tract, and skin irritant; (most PAHs have probable, possible carcinogenic potential) Reacts with acids and oxidizers; produces acrid smoke, toxic gases when involved in fires, thermal decomposition
Petroleum hydrocarbons (Fuel Oils)	Skin, eye, inhalation, ingestion	5mg/m^3 (mineral oil mist)	Irritating to skin, eyes, respiratory tract; headache, dizziness, nausea, vomiting and loss of coordination; an acne like rash, pimples around hair follicles; ingredients of fuel oils may be carcinogens Incompatible with strong oxidizing agents; thermal decomposition releases, toxic gases
Metals (e.g., Lead)	Inhalation, ingestion	0.050 mg/m^3	Weakness, insomnia; loss of appetite, loss of weight, abdominal pain; anemia; tremors; weakness of wrists/ ankles; kidney damage; low blood pressure Incompatible with strong oxidizers, hydrogen peroxide and acids

The following general symptoms may indicate exposure to a hazardous chemical. Personnel will be removed from the work site and provided immediate medical attention if the following symptoms occur:

- Dizziness or stupor
- Nausea, headaches, or cramps
- Irritation of the eyes, nose, or throat
- Euphoria
- Chest pains and coughing
- Rashes or burns

The table below lists the compounds of concern (with maximum concentrations) at Site 3 as well as their potential route of exposure.

Contaminants of Concern

(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Arsenic	GW: SB: SS:66.1	0.01 mg/m^3	5 Ca	Ulceration of nasal septum, respiratory irritation, dermatitis, gastrointestinal disturbances, peripheral neuropathy, hyperpigmentation	NA
Beryllium	SS: 1.3	0.002 mg/m3	4 mg/m3	A confirmed lung carcinogen. Anorexia, low-weight weakness, chest pain, coughing and irritation of eyes and skin.	N/A
Cadmium	GW: SB: SS:15.3	0.005 mg/m^3	9 Ca	Pulmonary edema, coughing, chest tightness/pain, headache, chills, muscle aches, nausea, vomiting, diarrhea, difficulty breathing, loss of sense of smell, emphysema, mild anemia	NA
Chromium (as Cr(II) & Cr(III))	GW: SB: SS:124	0.5 mg/m^3	25	Irritated eyes, sensitization dermatitis, histologic fibrosis of lungs	NA
DDT	GW: SB: SS:130 ug/kg	0.5 mg/m^3	500 Ca	Paresthesia of tongue, lips, hand, and face; tremors; dizziness; confusion; headache; fatigue; convulsion; eye and skin irritation; vomiting	UK
Lead	GW: SB: SS:2,070	0.05 mg/m^3	100	Weakness lassitude, facial pallor, pale eye, weight loss, malnutrition, abdominal pain, constipation, anemia, gingival lead line, tremors, paralysis of wrist and ankles, encephalopathy, kidney disease, irritated eyes, hypertension	NA
Nickle	GW: SB: SS:77.8	1 mg/m3	10 mg/m3 Ca	Sensitization dermatitis, allergic asthma and a suspected lung carcinogen	NA
Petroleum Hydrocarbons		300 ppm as gasoline	Ca	Petroleum products can cause dry skin, irritation, anesthetic effects, loss of coordination, central nervous system depression, and death. Overexposure may cause an exaggerated sense of well being, excitement, headache, dizziness, incoherent speech, narcosis, central nervous system stimulation and then depression, respiratory paralysis, respiratory irritation, vomiting, skin cancer, and death. Fuels have been associated with skin and kidney cancer.	UK
Polyaromatic Hydrocarbons -PAHs (Limits as Coal Tar Pitch)	GW: SB: SS:6.5	02 mg/m^3	80 Ca	Dermatitis and bronchitis; PAHs are a NIOSH Appendix A carcinogen.	UK

Contaminants of Concern

(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum[a] Concentration (ppm)	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Vanadium	GW: SB: SS:79.8	0.05 mg/m3 Ceiling	35 mg/m3	Vanadium dust causes irritation to the eyes, skin and throat. Symptoms of overexposure include metallic taste, green tongue, eczema, coughing and wheezing.	NA
Zinc	SS: 3760	5 mg/m3	500 mg/m3	Metal fume fever with chills, muscle aches, nausea, fever, dry throat and coughing, metallic taste; headache; blurred vision; tightness in chest and decreased pulmonary function	N/A

Footnotes:

[a] Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).

[b] Appropriate value of PEL, REL, or TLV listed.

[c] IDLH = immediately dangerous to life and health (units are the same as specified “Exposure Limit” units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

Potential Routes of Exposure

Dermal: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.	**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.	**Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

2.1.1 Lead

Lead is particular concern to worker safety and consistent with OSHA's "Lead Standard" contained in 29 CRF 1926.62, project personnel potentially exposed to airborne concentrations of lead during project activities will be provided with lead hazard communication training. Levels of lead in soil at Site 3 were detected with a maximum concentration of 2,070 ppm.

The following requirements pertain to lead contaminated soils:

- Work shall progress in a sequence from less contaminated to more contaminated areas.
- Water should be added to soils prior to and during excavation, air rotary drilling, and other activities that create or have the potential to create airborne lead contaminated dust. For air rotary drilling operations, water can be added to the boring to reduce dust generation from the cyclone. Depending upon soil type, watering of soil may be required several days prior to commencing ground intrusive activities.
- Personnel working in the vicinity of lead contaminated soil shall wear disposable coveralls or equal and exercise enhanced personal hygiene (i.e., frequent hand washing prior to eating, drinking, and smoking; separation of work and street clothing/footwear; etc.).

2.2 Hazard Communication

The purpose of hazard communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at this field project site are transmitted (communicated) according to 29 CFR 1926.59 to all JV I personnel and JV I subcontractors. All on-site personnel that may come in contact with potential exposure pathway shall be 40 hour OSHA trained and be up to date with their 8hr refresher course in accordance with 29 CFR 1910.120. Certificates of all workers must be provided to the ROICC prior to mobilization. No workers will be allowed to work on-site without valid proof of certification. Hazard communication will include the following:

2.2.1 Container Labeling

JV I personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on site by operations. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party. All drums will list Mrs. Valerie Walker as the CNRMA POC.

2.2.2 Material Safety Data Sheets (MSDSs)

There will be an MSDS located on site for each hazardous chemical to be used on site. All chemical MSDSs will be appended into Appendix A of this HASP.

2.2.3 Employee Information and Training

Training employees on chemical hazards is accomplished through on ongoing corporate training program. Additionally, chemical hazards are communicated to employees through daily safety meetings held at JV I. field projects and by an initial site orientation program.

At a minimum, JV I and related subcontractor employees will be instructed on the following:

- Chemicals and their hazards in the work area
- How to prevent exposure to these hazardous chemicals
- What the company has done to prevent workers' exposure to these chemicals

- Procedures to follow if they are exposed to these chemicals.
- How to read and interpret labels and MSDSs for hazardous substances found on JV I sites
- Emergency spill procedures
- Proper storage and labeling

Before any new hazardous chemical is introduced on site, each JV I. and related subcontractor employee will be given information in the same manner as during the safety class. The site supervisor will be responsible for seeing that the MSDS on the new chemical is available for review by on site personnel. The information pertinent to the chemical hazards will be communicated to project personnel.

Morning safety meetings will be held and the hazardous materials used on site will be discussed. Attendance is mandatory for all on site employees.

2.3 Physical Hazards

To minimize physical hazards, JV I has developed standard safety protocols that will be followed at all times. Failure to follow safety protocols will result in removal of an employee from the site and appropriate disciplinary actions.

The SSG will observe the general work practices of each crew member and equipment operator, and enforce safe procedures. The SSG and crew leaders will inspect Work areas daily. All hazards will be corrected in a timely manner. A variety of physical hazards may be encountered during work activities at this site. Activity Hazard Analyses (AHAs) will be developed for each principal activity and will identify all major hazards to which employees may be exposed. Hard hats, safety glasses, and steel-toe safety boots are required in all construction areas of the site. Site-specific hazards and all necessary precautions will be discussed at the daily tailgate safety meetings.

Physical hazards include safety and environmental hazards. The following physical hazards may be present during project activities:

- Heat stress
- Explosion
- Biological hazards (ticks, mosquitoes)
- Severe weather (Hurricane season)
- Manual lifting/back strain
- Noise
- Fire
- Electrical shock
- Vehicle/equipment traffic

Heat stress prevention procedures will be implemented according to HS400. Personal noise will be controlled by instituting the Hearing Conservation Program in accordance with JV I.

2.4 Activity Hazard Analyses

Appendix A of this HASP contains AHA's for primary site tasks. These pre-mobilization AHA's are general in nature and must be made project specific by the PM and SSO prior to field work involving each task. They contain detailed information on site hazards, and provide control measures for these hazards. The AHA's will be field checked by the SSO on an ongoing basis and revised as necessary. All revisions will be communicated to the work crew.

SECTION 3

Work and Support Areas

Work areas will be delineated and controlled as per 29 CFR 1926 for construction sites, EM 385-1-1.

The following are standard safe work practices that apply to all site personnel and will be discussed in the safety briefing prior to initiating work on the site:

- Eating, chewing tobacco, smoking is prohibited in any active work area unless otherwise designated by the PSO.
- Hands must be washed upon leaving the Work Area and before eating, chewing tobacco, and smoking.
- A buddy system will be used. Hand signals will be established to maintain communication.
- During site operations, each worker will consider himself as a safety backup to their partner. Off-site personnel provide emergency assistance.
- Visual contact will be maintained between buddies on site when performing hazardous duties.
- No personnel will be admitted to the site without proper authorization from JV I or the owner.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SSO, will be immediately dismissed from the site.
- Proper decontamination procedures, when required, must be followed before any equipment leaves the site.
- All employees and visitors must sign in and out of the site.

SECTION 4

Protective Equipment

This section specifies the levels of personal protective equipment (PPE) that are or may be required for each principal activity performed at this site. All site personnel must be trained in the use of all PPE utilized. The PPE program will be applied to project activities.

4.1 Anticipated Protection Levels

The following protection levels have been established for the site work activities at SJCA. Barrier crams/insect repellant or PPE, where prescribed, will be used as a deterrent to exposure to biting insects. Results of site air monitoring (for confined space entry) and visual inspection of the work activities may indicate the need for changes in PPE level(s).

Task	Initial PPE Level	Upgrade PPE Level	Skin Protection	Respiratory Protection	Other PPE
Site Setup Soil Excavation	Level D		Generally none; Some activities may require Tyvek coveralls to prevent incidental contact with insects/ poison ivy.	None	Hard-hat, Steel-toe work boots, safety eyewear (safety glasses with side shields or goggles and face shield), leather work gloves and hearing protection >85 dBA
Soils Screening and Load -out	Level D with Tyvek	Level C	None	None	Hard-hat, Steel-toe work boots, safety eyewear (safety glasses with side shields, goggles, or face shields for chain saw work), hearing protection> 85 dBA
Equipment Decontamination	Level D+	Level C	PVC rain-suit and splash shield for pressure washing operations.	Possible Full Face	Hard-hat, Steel-toe work boots latex gloves, latex boots and hearing protection> 85 dBA
General SZ Activities	Level D		None	None	Hard-hat, Steel-toe work boots, leather work gloves, Safety glasses
Confirmation and Pre-Characterization Sampling Activities	Level D with Tyvek	Level C	Latex gloves	Generally none, but may be upgraded based on breathing zone concentrations	Hard-hat, Steel-toe work boots, leather work gloves, Safety glasses

4.2 Protection Level Descriptions

This section lists the. minimum requirements for each protection level. Modification to these requirements may have been noted above.

4.2.1 Level D

Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Work clothing as prescribed by weather
- Leather gloves

4.2.2 Modified Level D

Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, latex or PVC overboots
- Outer nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)
- Tyvek coverall [Polyethylene-coated Tyveks required when workers have a potential to be exposed to contaminated liquids or sludge.]

4.2.3 Level C

Level C consists of the following:

- Full-face, half face, or powered air-purifying respirator with appropriate cartridges
- Hooded Tyvek Coveralls [Polyethylene-coated Tyveks required when workers have a potential to be exposed to contaminated liquids or sludge].
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, latex or PVC overboots
- Nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)

4.3 Air Purifying Respirators

A NIOSH approved full-face respirator with appropriate air purifying cartridges will be used for level C work. The crew members working in Level C will wear respirators equipped with air-purifying cartridges approved for: dusts, fumes and mists with a TWA <0.05 mg/m^3.

SECTION 5

Decontamination Procedures

This section describes the general decontamination procedures necessary to ensure that both personnel and equipment are free from contamination when they leave the work site.

5.1 Personnel Decontamination

Decontamination procedures will ensure that material which workers or vehicles may have contacted in site work are not transmitted off site. General decontamination will consist of removing and discarding of disposable clothing and washing of the hands and face.

5.1.1 Suspected Contamination

Any employee suspected of sustaining skin contact with chemical materials will first use an emergency shower. Following a thorough drenching, the worker will proceed to an established decontamination facility. Here the worker will remove clothing, shower, don clean clothing, and immediately be taken to the first aid station. Medical attention will be provided as determined by the degree of injury.

5.1.2 Personal Hygiene

Before any eating, smoking, or drinking, personnel will wash hands, arms, neck and face.

5.2 Equipment Decontamination

All equipment, when required, will be decontaminated before leaving the site. Decontamination procedures will vary depending upon the contaminant involved, but may include hosing, or steaming the exterior of the equipment. A decontamination area will be set up for the equipment decontamination and wash water contained and properly disposed. Personnel performing this task will wear the proper PPE as prescribed by the PSO.

5.3 Disposal

All decontamination liquids and disposable clothing that are contaminated with chemical materials (motor fuels/gasoline) will be handled as contaminated waste unless determined otherwise by accepted testing methods. Hazardous wastes generated will be disposed of according to state and federal regulations.

SECTION 6

Air Monitoring

Air monitoring will be conducted in order to characterize potential personnel exposures during confined space entry procedures. The target compound selected for direct reading air-monitoring purposes is toxic or oxygen deficient atmospheres within confined spaces.

6.1 Confined Space Air Monitoring

Air monitoring at the SJCA will not be required nor implemented based on historical information and analytical data. In the event an air monitoring program is required, the following section would apply.

6.1.1 Direct Reading Air Monitoring

During soil stabilization, excavation and load-out activities, direct reading air monitoring shall be performed to determine potential exposure to workers. A summary of air monitoring information is provided in the table below.

Monitoring Device	Monitoring Location/Personnel	Monitoring Frequency	Action Level	Action
Mini-RAM (total dust)	Excavation, sampling, screening, load-out	continuous during Soil excavation and load-out activities	<0.025 mg/m^3 (TWA) 0.025 mg/m^3 2.5 mg/m^3 (TWA) >2.5mg/m^3 (TWA)	Level D Level C Stop work, consult Project CIH
PID	Excavation, sampling, screening, load-out	Periodically during Soil excavation and load-out activities	<10ppm ≥10 ppm; <25 ppm* ≥2.5 ppm	Level D Level C; consult Program HSM/CIH Level B; stop work consult Program HSM/CIH (Richard Rathnow of CH2M HILL or Troy Izatt of AGVIQ)
LEL	Excavation	Periodically during Soil excavation	0-10% : 10-25% LEL: >25% LEL	Level D Level C; consult Program HSM/CIH Level B; stop work consult Program HSM/CIH (Richard Rathnow of CH2M HILL or Troy Izatt of AGVIQ)

Monitoring Device	Monitoring Location/Personnel	Monitoring Frequency	Action Level	Action
O^2	Excavation	Periodically during Soil excavation	>25%[c] O_2:	Level D
			20.9%[c] O_2 <19.5%[c] O_2:	Level C; consult Program HSM/CIH
				Level B; stop work consult Program HSM/CIH (Richard Rathnow of CH2M HILL or Troy Izatt of AGVIQ)

*Sustained levels. PID readings over 10 ppm may require monitoring with a benzene detector.

6.2 Instrumentation

The following is a description of the direct reading air monitoring equipment to be used at this site.

6.2.1 Real-Time Aerosol Monitor (Miniram Model PDM-3 and Model Pr100 Data Ram)

6.2.1.1 Type and Operational Aspects

- Detection of light in the near infrared region back-scattered to a sensor (photovoltaic detector) by airborne particulate in a sensing volume
- The higher the dust concentration the more back-scattering of light to the sensor, resulting in increased readings
- Device calibrated at the factory against an air sampling filter/gravimetric analysis reference method

6.2.1.2 Calibration Methods/Frequencies

There is no calibration method or procedure for calibrating the Mini-RAM monitor. However, it is recommended that the Mini-RAM monitor be re-zeroed once a week. During a zero check, the sampled air passes through the purge air filter and dryer to effect a self-cleaning of the optical chamber.

6.2.1.3 Preventative Maintenance

Maintenance of the Mini-RAM consists of replacement of filters and desiccant; battery replacement; and cleaning of the optical detection assembly.

6.2.2 Photoionization Detector (PID)

6.2.2.1 Type and Operational Aspects

PID Model PI 101 or equivalent

Principle of Operation

- Ionization potential (IP) - The energy required to remove the outermost electron from a molecule; measured in electron volts (eV); characteristic property of a specific chemical.

- Photoionization - Using ultraviolet (UV) light to remove the outermost electron from a molecule.
- Energy of UV light (10.2, 9.5, 11.7 eV) must be equal to or greater than the IP to photoionize the molecule.
- Fan or pump is used to draw air into the detector where the contaminants are exposed to a UV light source (lamp).
- Ions are collected on a charged plate and produce a current directly proportional to the number of ionized molecules; current is amplified and displayed on the meter.

6.2.2.2 Calibration Method/Frequencies

The PID Model PI 101 is designed for trace gas analysis in ambient air and is calibrated at HNU with certified standards of benzene, vinyl chloride, and isobutylene. Other optional calibrations are available (e.g., ammonia, H2S, etc.).

JV I will use a PID with a 10.2 eV lamp. This lamp has been determined to be most responsive to the contaminants on site. Optional probes containing lamps of 9.5 and 11.7 eV are interchangeable in use within individual read-out assemblies for different applications.

The approximate span settings for the probe that would give different readings of the amounts of trace gas of a particular species in a sample are based upon the relative photoionization sensitivities of various gases twice daily (beginning and end of shift).

It is recommended that calibration be checked twice each day (beginning and end of shift). The SSO will record and log such calibration information into an air monitoring notebook.

6.2.2.3 Preventative Maintenance

Maintenance of the PID Model PI 101 consists of cleaning the lamp and ion chamber, and replacement of the lamp or other component parts or sub-assemblies.

6.3 Air Monitoring Log

The SSO will ensure that all air monitoring data is logged into a monitoring notebook. Data will include instrument used, wind direction, work process, etc. The COM and/or the CIH may periodically review this data.

6.4 Calibration Requirements

The LEL/02 and PID will be calibrated daily before and after use. A separate log will be kept detailing date, time, span gas, or other standard, and name of person performing the calibration.

6.5 Air Monitoring Results

Air monitoring results will be posted for personnel inspection, and will be discussed during morning safety meetings. Air sampling results will be forwarded to the COM to be incorporated into the employee(s)' medical records.

SECTION 7

Emergency Response

7.1 Pre-emergency Planning

Prior to engaging in construction activities at the site, will plan for possible emergencies and have available adequate supplies and manpower to respond. In addition, site personnel will receive training during the site orientation concerning proper emergency response procedures.

The following situations would warrant implementation of the Emergency Response and Contingency Plan (ERCP) summarized here in Section 8.

Fire/Explosion	The potential for human injury exists. Toxic fumes or vapors are released. The fire could spread on site or off site and possibly ignite other flammable materials or cause heat-induced explosions. The use of water and/or chemical fire suppressants could result in contaminated run-off. An imminent danger of explosion exists.
Spill or Release of Hazardous Materials	The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard. The spill could cause the release of toxic liquids or fumes in sufficient quantities or in a manner that is hazardous to or could endanger human health.
Natural Disaster	A rainstorm exceeds the flash flood level. The facility is in a projected hurricane path or a hurricane has damaged facility property (see Appendix C) Severe wind gusts are forecasted or have occurred and have caused damage to the facility
Medical Emergency	Overexposure to hazardous materials. Trauma injuries (broken bones, severe lacerations/bleeding, burns). Eye/skin contact with hazardous materials. Loss of consciousness. Heat stress (Heat stroke). Heart attack. Respiratory failure. Allergic reaction.

The following measures will be taken to assure the availability of adequate equipment and manpower resources:

- Sufficient equipment and materials will be kept on site and dedicated for emergencies only. The inventory will be replenished after each use.

- On-site emergency responders will be current in regards to training and medical surveillance programs. Copies of all applicable certificates will be kept on file for on-site personnel required to respond.
- It will be the responsibility of the emergency coordinator to brief the on-site response team on anticipated hazards at the site. The emergency coordinator shall also be responsible for anticipating and requesting equipment that will be needed for response activities.
- Emergency response activities will be coordinated with the Local Emergency Management Agency (EMA) in compliance with SARA Title III requirements.

Communications will be established prior to commencement of any activities at the remediation site. Communication will be established so that all responders on site have availability to all pertinent information to allow them to conduct their activities in a safe and healthful manner. Air horns may be used to alert personnel of emergency conditions. A telephone will be located at the command post to summon assistance in an emergency.

Primary communication with local responders in the event of an emergency will be accomplished using commercial telephone lines.

7.2 Emergency Recognition and Prevention

Because unrecognized hazards may result in emergency incidents, it will be the responsibility of the Site Safety Officer (SSO), through daily site inspections and employee feedback (Safety Observation Program), daily safety meetings, and Activity Hazard Analyses to recognize and identify all hazards that are found at the site. These may include:

Chemical Hazards	Materials at the site Materials brought to the site
Physical Hazards	Fire/explosion Slip/trip/fall Electrocution Confined space IDLH atmospheres Excessive noise
Mechanical Hazards	Heavy equipment Stored energy system Pinch points Electrical equipment Vehicle traffic
Environmental Hazards	Electrical Storms High winds Heavy Rain/Snow Temperature Extremes (Heat/Cold Stress) Poisonous Plants/Animals

Once a hazard has been recognized, the SSO will take immediate action to prevent the hazard from becoming an emergency. This may be accomplished by the following:

- Daily safety meeting
- Task-specific training prior to commencement of activity
- Lock-out/tag-out
- Personal Protective Equipment (PPE) selection/use
- Written and approved permits for hot work, confined space

- Trenching/shoring procedure
- Air monitoring
- Following all JV I standard operating procedures
- Practice drills for fire, medical emergency, and hazardous substances spills.

Emergency Telephone Numbers

Local and State Agencies	
Ambulance	911
Fire	911
Police	911
Hospital—Portsmouth Naval Hospital	757-953-5000
Maryview Medical Center	757-398-2200
See Figure 7-2 for directions to the hospital	
Regional Poison Control Center	800-282-5846
VDEQ – Debbie Miller	804-698-4206
Federal Agencies	
Center for Disease Control	404-639-3311
USEPA – Todd Richardson	215-814-5264
LANTDIV	
ROICC—Peter Gorrell	757-396-5121 x 321
RPM—Dawn Hayes	757-322-4792
CNRMA—Valerie Walker	757-887-4775
PWC Facilities—Leroy Eaves	757-485-6574
JV I Personnel	
Project Manager—David Leadenham	757-318-9420
Site Supervisor—Scott Hendershot	757-544-6965
Site Safety Officer—Scott Hendershot	757-544-6965
UXO Specialist—EOTI (Wayne Lewellen)	732-671-6017
Program Health and Safety Managers	
CH2M HILL – Richard Rathnow	865-483-9032
AGVIQ – Troy Izatt	907-365-6182

7.3 Personnel Roles, Lines of Authority, and Communications

This section of the HASP (ERCP) describes the various roles, responsibilities, and communication procedures that will be followed by personnel involved in emergency responses.

The primary emergency coordinator for this site is the SSO. In the event an emergency occurs and the emergency coordinator is not on site, the Alternate Superintendent/Site Safety Officer or the highest-ranking employee on site will serve as the emergency coordinator until he arrives. The emergency coordinator will determine the nature of the emergency and take appropriate action as defined by this HASP (ERCP).

The emergency coordinator will implement the HASP (ERCP) immediately as required. The decision to implement the plan will depend upon whether the actual incident threatens human health or the environment. Immediately after being notified of an emergency incident, the emergency coordinator or his designee will evaluate the situation to determine the appropriate action.

7.3.1 Responsibilities and Duties

This section describes the responsibilities and duties assigned to the emergency coordinator.

It is recognized that the structure of the "Incident Command System" will change as additional response organizations are added. JV I will follow procedures as directed by the Fire Department, LEPC, State and Federal Agencies as required. JV I will defer to the local Fire Department chief to assume the role of Incident Commander upon arriving on site. Additional on-site personnel may be added to the Site Emergency Response Team as required to respond effectively.

7.3.2 On-Site Emergency Coordinator Duties

The on-site emergency coordinator is responsible for implementing and directing the emergency procedures. All emergency personnel and their communications will be coordinated through the emergency coordinator. Specific duties are as follows:

- Identify the source and character of the incident, type and quantity of any release. Assess possible hazards to human health or the, environment that may result directly from the problem or its control.
- Discontinue operations in the vicinity of the incident if necessary to ensure that fires, explosions, or spills do not recur or spread to other parts of the site. While operations are dormant, monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes, or other equipment, where appropriate.
- Notify local Emergency Response Teams if their help is necessary to control the incident. Table 8-2 provides telephone numbers for emergency assistance.
- Direct on-site personnel to control the incident until, if necessary, outside help arrives.
- Ensure that the building or area where the incident occurred and the surrounding area are evacuated and shut off possible ignition sources, if appropriate. The Emergency Response Team is responsible for directing site personnel such that they avoid the area of the incident and leave emergency control procedures unobstructed.
- If fire or explosion is involved, notify facility Fire Department.
- Notify JV I Project Manager and the owner's designated Representative.

- Have protected personnel, in appropriate PPE, on standby for rescue.

If the incident may threaten human health or the environment outside of the site, the emergency coordinator should immediately determine whether evacuation of area outside of the site may be necessary and, if so, notify the Police Department and the Office of Emergency Management.

When required, assist the Client with notification at the National Response Center. The following information should be provided to the National Response Center:

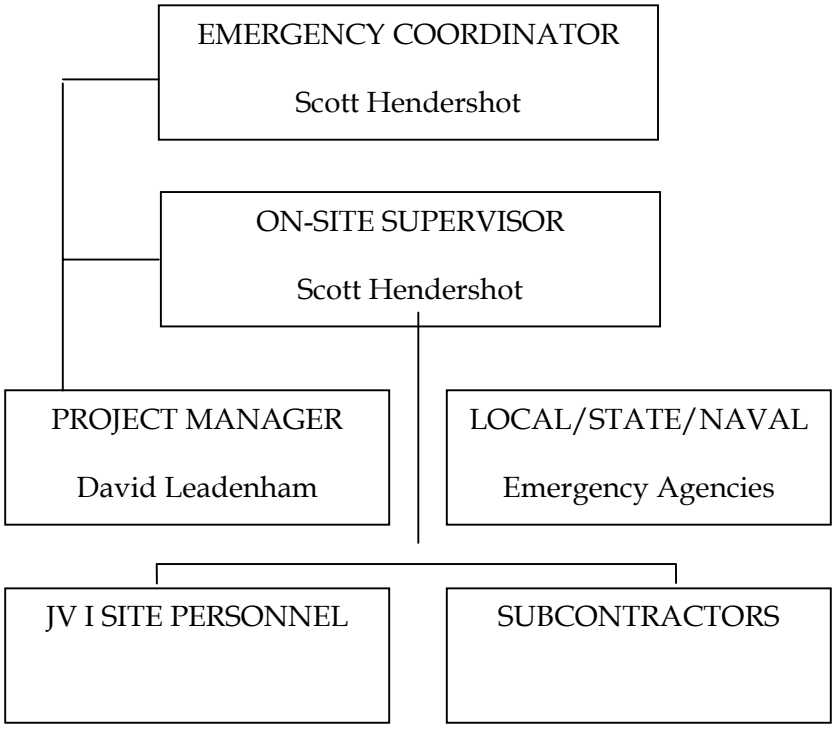
- Name and telephone number
- Name and address of facility
- Time and type of incident
- Name and quantity of materials involved, if known
- Extent of injuries
- Possible hazards to human health or the environment outside of the facility.

The emergency telephone number for the National Response Center is 800-424-8802.

If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or
- any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in
- the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.
- Notify the USEPA Regional Administrator that cleanup procedures have been completed and that all emergency equipment is fit for its intended use before resuming operations in the affected area of the facility. The USEPA Regional Administrator's telephone number is included in the Emergency Contacts.
- Record time, date, and details of the incident, and submit a written report to the USEPA Regional Administrator. Report is due to USEPA within 15 days of the incident.

FIGURE 7-1
Emergency Coordinator Organization Chart
St. Juliens Creek Annex
Chesapeake, Virginia



7.4 Safe Distances and Places of Refuge

The emergency coordinator for all activities will be the SSO. No single recommendation can be made for evacuation or safe distances because of the variety of emergencies, which could occur. Safe distances can only be determined at the time of an emergency based on a combination of site and incident-specific criteria. However, the following measures are established to serve as general guidelines.

In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will report initially to the contamination reduction zone. Small spills or leaks (generally less than 55 gallons) will require initial evacuation of at least 50 feet in all directions to allow for cleanup and to prevent exposure. After initial assessment of the extent of the release and potential hazards, the emergency coordinator or his designee will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, barricades, or personal monitors will be used to secure the boundaries.

In the event of a major hazardous material release (large spills of high toxicity/greater than 55 gallons), workers will be evacuated from the building/site. Workers will assemble at the entrance to the site for a head count by their foremen and to await further instruction.

If an incident may threaten the health or safety of the surrounding community, the public will be informed and, if necessary, evacuated from the area. The emergency coordinator, or his designee will inform the proper agencies in the event that this is necessary. Telephone numbers are listed in **Table 8.2.**

Places of refuge will be established prior to the commencement of activities. These areas must be identified for the following incidents:

- Chemical release
- Fire/explosion
- Power loss
- Medical emergency
- Hazardous weather

In general, evacuation will be made to the crew trailers, unless the emergency coordinator determines otherwise. It is the responsibility of the emergency coordinator to determine when it is necessary to evacuate personnel to off-site locations.

In the event of an emergency evacuation, all the employees will gather at the entrance to the site until a head count establishes that all are present and accounted for. No one is to leave the site without notifying the emergency coordinator.

7.5 Evacuation Routes and Procedures

All emergencies require prompt and deliberate action. In the event of an emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible. However, in specific emergencies, the emergency coordinator may deviate from the procedures to provide a more effective plan for bringing the situation under control. The emergency coordinator is responsible for determining which situations require site evacuation.

7.5.1 Evacuation Signals and Routes

Two-way radio communication and an air horn will be used to notify employees of the necessity to evacuate an area or building involved in a release/spill of a hazardous material. Total site evacuation will be initiated only by the emergency coordinator, however, in his absence, decision to preserve the health and safety of employees will take precedence. Evacuation routes will be posted in each outside work area. Signs inside buildings will be posted on walls or other structural element of a building. Periodic drills will be conducted to familiarize each employee with the proper routes and procedures.

7.5.2 Evacuation Procedures

In the event evacuation is necessary, the following actions will be taken:

- The emergency signal will be activated.
- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the site will cease in order to allow safe exit of personnel and movement of emergency equipment.
- Shut off all machinery if safe to do so.
- ALL on-site personnel, visitors, and contractors in the site work areas will assemble at the designated rally points for a head count and await further instruction from the emergency coordinator.
- ALL persons in the active work zones or regulated areas will be accounted for by their immediate crew leaders (e.g., foreman). Leaders will determine the safest exits for employees and will also choose an alternate exit if the first choice is inaccessible.
- During exit, the crew leader should try to keep the group together. Immediately upon exit, the crew leader will account for all employees in his crew.
- Upon completion of the head count, the crew leader will provide the information to the emergency coordinator.
- Contract personnel and visitors will also be accounted for.
- The names of emergency response team members involved will be reported to the emergency spill control coordinator.
- A final tally of persons will be made by the emergency coordinator or designee. No attempt to find persons not accounted for will involve endangering lives of JV I or other employees by reentry into emergency areas.

In all questions of accountability, immediate crew leaders will be held responsible for those persons reporting to them. Visitors will be the responsibility of those employees they are seeing. Contractors and truck drivers are the responsibility of the Project Superintendent. The security guard will aid in accounting for visitors, contractors, and truckers by reference to sign-in sheets available from the guard shack.

Personnel will be assigned by the emergency coordinator to be available at the main gate to direct and brief emergency responders.

Re-entry into the site will be made only after clearance is given by the emergency coordinator. At his direction, a signal or other notification will be given for re-entry into the facility.

Drills will be held periodically to practice all of these procedures and will be treated with the same seriousness as an actual emergency.

7.6 Emergency Spill Response Procedures and Equipment

In the event of an emergency involving a hazardous material spill or release, the following general procedures will be used for rapid and safe response and control of the situation. Emergency contacts found in **Table 8.2** provide a quick reference guide to follow in the event of a major spill.

7.6.1 Notification Procedures

If an employee discovers a chemical spill or process upset resulting in a vapor or material release, he or she will immediately notify the on-site emergency coordinator. On-site Emergency Coordinator will obtain information pertaining to the following:

- The material spilled or released.
- Location of the release or spillage of hazardous material.
- An estimate of quantity released and the rate at which it is being released.
- The direction in which the spill, vapor or smoke release is heading.
- Any injuries involved.
- Fire and/or explosion or possibility of these events.
- The area and materials involved and the intensity of the fire or explosion.

This information will help the on-site emergency coordinator to assess the magnitude and potential seriousness of the spill or release.

7.6.2 Procedure for Containing/Collecting Spills

The initial response to any spill or discharge will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If for some reason a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large (greater than 55 gallons) and involves a tank or a pipeline rupture, an initial isolation of at least 100 ft. in all directions will be used. Small spills (less than or equal to 55 gallons) or leaks from a tank or pipe will require evacuation of at least 50 ft. in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient conditions), further evacuation will be enforced. In general an area at least 500 feet wide and 1,000 feet long will be evacuated downwind if volatile materials are spilled. (Consult the DOT Emergency Response Guide for isolation distances for listed hazardous materials.)

If an incident may threaten the health or safety of the surrounding community, the public will be informed and possibly evacuated from the area. The on-site emergency coordinator will inform the proper agencies in the event this is necessary. (Refer to **Table 8.2)**

As called for in regulations developed under the comprehensive Environmental Response Compensation Liability Act of 1980 (Superfund), JV I's practice is to report a spill of a pound or more

of any hazardous material for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA. TMS also follows the same practice for any substances not listed in the Acts noted above but which can be classified as a hazardous waste under RCRA.

Clean up personnel will take the following measures:

- Make sure all unnecessary persons are removed from the hazard area.
- Put on protective clothing and equipment.
- If a flammable material is involved, remove all ignition sources, and use spark and explosion proof equipment for recovery of material.
- Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.
- If wastes reach a storm sewer, try to dam the out-fall by using sand, earth, sandbags, etc. If this is done, pump this material out into a temporary holding tank or drums as soon as possible.
- Place all small quantities of recovered liquid wastes (55 gallons or less) and contaminated soil into drums for incineration or removal to an approved disposal site.
- Spray the spill area with foam, if available, if volatile emissions may occur.
- Apply appropriate spill control media (e.g. clay, sand, lime, etc.) to absorb discharged liquids.
- For large spills, establish diking around leading edge of spill using booms, sand, clay or other appropriate material. If possible, use diaphragm pump to transfer discharged liquid to drums or holding tank.

7.6.3 Emergency Response Equipment

The following equipment will be staged in the support zone and throughout the site, as needed, to provide for safety and first aid during emergency responses. (Emergency eyewash equipment must meet the applicable ANSI Standard);

- ABC-type fire extinguisher
- First-aid kit, industrial size
- Eyewash
- Emergency signal horn
- Emergency shower

In addition to the equipment listed above, JV I will have access to a direct reading instrumentation that may be used in emergency situations to assess the degree of environmental hazard. This equipment will only be used by the Site Safety Officer or other specially trained personnel. This equipment will be stored, charged and ready for immediate use in evaluating hazardous chemical concentrations. The equipment will primarily be located at a nearby office location.

Portable H-NU Photoionization Meter	Measures selected inorganic and organic chemical concentrations
MIE Data RAM	Measures total/respirable particulates in air

7.6.4 Emergency Spill Response Clean-Up Materials and Equipment

A sufficient supply of appropriate emergency response clean-up and personal protective equipment will be inventoried and inspected, visually, on a weekly basis.

The materials listed below may be kept on site for spill control, depending on the types of hazardous materials present on site. The majority of this material will be located in the support zone, in a supply trailer, storage area, or warehoused by a subcontractor.

- Sand or clay to solidify/absorb liquid spills.
- Appropriate solvents, e.g., CITRIKLEEN, for decontamination of structures or equipment.

**NOTE: All contaminated soils, absorbent materials, solvents and other materials resulting from the clean-up of spilled or discharged substances shall be properly stored, labeled, and disposed of off-site.*

7.7 Emergency Response Contingency Plan

This section of the ERCP details the contingency measures JV I will take to prepare for and respond to fires, explosions, spills and releases of hazardous materials, hazardous weather, and medical emergencies. An Accident Prevention Plan is included as **Appendix B.**

7.7.1 Medical Emergency Contingency Measures

The procedures listed below will be used to respond to medical emergencies. The SSO will contact the local hospital and inform them of the site hazards and potential emergency situations. A minimum of two First-Aid/CPR trained personnel will be maintained on site per shift.

7.7.1.1 Response

The nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident. The work crew supervisor will be summoned. The work crew supervisor will immediately make contact with the on-site emergency coordinator to alert him of a medical emergency situation. The supervisor will advise the following information:

- Location of the victim at the work site
- Nature of the emergency
- Whether the victim is conscious
- Specific conditions contributing to the emergency, if known

The following actions will then be taken depending on the severity of the incident:

Life-Threatening Incident

If an apparent life-threatening condition exists, the crew supervisor will inform the emergency coordinator and the local Emergency Response Services (ERS) will be immediately called. An on-site person will be appointed who will meet the ERS and have him/her quickly taken to the victim. Any injured person within the regulated areas will be evacuated by JV I personnel to a clean area for treatment by (ERS) personnel. No one will be able to enter the regulated area without showing proof of training, medical surveillance and site orientation.

Non Life-Threatening Incident

If it is determined that no threat to life is present, the SSO will, if applicable, direct the injured person through decontamination procedures (see below) appropriate to the nature of the illness or accident. Appropriate first aid or medical attention will then be administered.

**NOTE: The area surrounding an accident site must not be disturbed until the scene has been cleared by the SSO.*

Any personnel requiring emergency medical attention will be evacuated from active work zones or regulated areas if doing so would not endanger the life of the injured person or otherwise aggravate the injury. Personnel will not enter the area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant. For some emergency victims, immediate decontamination may be an essential part of life-saving first aid. For others, decontamination may aggravate the injury or delay life-saving first aid. Decontamination will be performed if it does not interfere with essential treatment.

If decontamination can be performed, observe the following procedures:

- Wash external clothing and cut it away.

If decontamination cannot be performed, observe the following procedures:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel.
- Alert emergency and off site medical personnel to potential contamination, instruct them about specific decontamination procedures.
- Send site personnel familiar with the incident and chemical safety information, e.g. MSDS, with the affected person.

FIGURE 7-2
Hospital Route Map

Hospital

Hospital Name/Address: Mayview Medical Center
3636 High Street
Portsmouth, VA 23707

Hospital Phone #: 757-398-2200

Directions to Hospital

1. Leave main gate of Annex and take left onto Victory Blvd.
2. Continue on **VICTORY BLVD** - go **0.3** mi
3. Turn right onto **US-17** (George Washington Hwy) - go **1.2** mi
4. Turn left onto **FREDERICK BLVD** - go **2.4** mi
5. Turn left onto **HIGH ST** - go **0.4** mi
6. Arrive at **3636 HIGH ST.** Maryview Medical Center is on the right after the first stop light.

(Total distance about 4.5 miles).

All injuries, no matter how small, will be reported to the SSO and the PM. An accident/injury/illness report will be completely and properly filled out and submitted to the COM, in accordance with JV I's reporting procedures.

A list of emergency telephone numbers is given in **Table 8.2.**

7.7.1.2 Notification

The following personnel/agencies will be notified in the event of a medical emergency:

- Local Fire Department or EMS
- On-site Emergency Coordinator
- Workers in the affected areas
- Norfolk Naval Shipyard ROICC Representative

7.7.2 Fire Contingency Measures

JV I personnel and subcontractors are not trained professional firefighters. Therefore, if there is any doubt that a fire can be quickly contained and extinguished, personnel will notify the emergency coordinator by radio and vacate the structure or area. The emergency coordinator will immediately notify the local Fire Department.

The following procedures will be used to prevent the possibility of fires and resulting injuries:

- Sources of ignition will be kept away from where flammable materials are handled or stored.
- The air will be monitored for explosivity before and during hot work and periodically where flammable materials are present. Hot work permits will be required for all such work.
- "No smoking" signs will be conspicuously posted in areas where flammable materials are present.
- Fire extinguishers will be placed in all areas where a fire hazard may exist.
- Before workers begin operations in an area the foreman will give instruction on egress procedures and rally points. Egress routes will be posted in work areas and exit points clearly marked.

7.7.2.1 Response

The following procedures will be used in the event of a fire:

- Anyone who sees a fire will notify their supervisor who will then contact the Emergency Coordinator. The emergency coordinator will activate the emergency air horns and contact the Base Fire Department.
- When the emergency siren sounds, workers will disconnect electrical equipment in use (if possible) and proceed to the nearest fire exit, or pre-designated rally point.
- Work crews will be comprised of pairs of workers (buddy system) who join each other immediately after hearing the fire alarm and remain together throughout the emergency. Workers will assemble at a predetermined rally point for a head count.
- When a small fire has been extinguished by a worker, the emergency coordinator will be notified.

7.7.3 Hazardous Weather Contingency Measures

Operations conducted outdoors will not be started or continued when the following hazardous weather conditions are present:

- Lightning
- Heavy Rains
- High Winds

7.7.3.1 Response

- Excavation/soil stock piles will be covered with plastic liner.
- All equipment will be shut down and secured to prevent damage.
- Personnel will be moved to safe refuge, initially crew trailers. The emergency coordinator will determine when it is necessary to evacuate personnel to off-site locations and will coordinate efforts with fire, police and other agencies.

7.7.3.2 Notification

The emergency coordinator will be responsible for assessing hazardous weather conditions and notifying personnel of specific contingency measures. Notifications will include:

- JV I employees and subcontractors
- Norfolk Naval Shipyard Representative
- Local Emergency Management Agency (if conditions warrant)

7.7.4 Spill/Release Contingency Measures

In the event of release or spill of a hazardous material the following measures will be taken:

7.7.4.1 Response

Any person observing a spill or release will act to remove and/or protect injured/contaminated persons from any life-threatening situation. First aid and/or decontamination procedures will be implemented as appropriate.

First aid will be administered to injured/contaminated personnel. Unsuspecting persons/vehicles will be warned of the hazard. All personnel will act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons. Attempt to stop the spill at the source, if possible. Without taking unnecessary risks, personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve or temporarily sealing a hole with a plug.

The emergency coordinator will be notified of the spill/release, including information on material spilled, quantity, personnel injuries and-immediate life-threatening hazards. Air monitoring will be implemented by the SSO to determine the potential impact on the surrounding community. Notification procedures will be followed to inform on-site personnel and off-site agencies. The emergency coordinator will make a rapid assessment of the spill/release and direct confinement, containment and control measures. Depending upon the nature of the spill, measures may include:

- Construction of a temporary containment berm utilizing on-site clay absorbent earth
- Digging a sump, installing a polyethylene liner and

- Diverting the spill material into the sump placing drums under the leak to collect the spilling material before it flows over the ground
- Transferring the material from its original container to another container

The emergency coordinator will notify the Base representative of the spill and steps taken to institute clean-up. Emergency response personnel will clean-up all spills following the spill clean-up plan developed by the emergency coordinator. Supplies necessary to clean up a spill will be immediately available on-site. Such items may include, but are not limited to:

- Shovel, rake
- Clay absorbent
- Polyethylene liner
- Personal safety equipment
- Steel drums
- Pumps and miscellaneous hand tools

The major supply of material and equipment will be located in the designated support area (TBD). Smaller supplies will be kept at active work locations. The emergency coordinator will inspect the spill site to determine that the spill has been cleaned up to the satisfaction of the Base representative. If necessary, soil, water or air samples may be taken and analyzed to demonstrate the effectiveness of the spill clean-up effort. The emergency coordinator will determine the cause of the spill and determine remedial steps to ensure that recurrence is prevented. The emergency coordinator will review the cause with the Base representative and obtain his concurrence with the remedial action plan.

SECTION 8

Training Requirements

Site-specific training for St. Juliens Creek Annex will include Hazard Communication as per 29 CFR 1926, site physical and environmental hazards, emergency response and evacuation procedures, and emergency telephone numbers will be held at the site location by the SSO before any site work activities begin.

All on-site personnel that may come in contact with potential exposure pathway shall be 40 hour OSHA trained and be up to date with their 8hr refresher course in accordance with 29 CFR 1910.120. Certificates of all workers must be provided to the ROICC prior to mobilization. No workers will be allowed to work on-site without valid proof of certification.

Outlines of the orientation for JV I sub-contract personnel and visitors are presented below:

- HASP review and sign off
- Sign in/out procedures
- Site background
- Chain of command
- Rules and regulations
- Hours of work
- Absences
- Equipment open to visitors
- Emergency Information
- Emergency signal
- Gathering point
- Responsibilities/roles
- Emergency phone numbers
- Work Areas
- Material Safety Data Sheets (MSDS) [Hazard Communication Program]
- AHA's (Activity Hazard Analyses)
- Forms, site-specific
- Incident Reporting
- Sign in/out procedures
- Review of Site map
- Work Areas
- Hazard Communication
- Emergency plan/signals
- Training/medical requirements
- Work zones and regulated areas open to visitors

SECTION 9

Medical Surveillance Program

All JV I field personnel participate in a medical and health monitoring program. The COM will be immediately notified of any suspected exposures.

Appendix A
Activity Hazard Analyses

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Equipment/Facility Set-up	Slips, Trips, Falls	• Clear walkways work areas of equipment, tools, vegetation, excavated material and debris • Mark, identify, or barricade other obstructions • Evaluate fall hazards above 4 ft; use fall protection equipment (harness/lanyard), standard guardrails or other fall protection systems when working on elevated platforms above 6 ft. • Use “heavy duty industrial” (type 1A) ladders • Tie-off all straight/extension ladders or manually hold by co-worker at base • Halt roof, exterior scaffold work in high winds, severe weather	Body harnesses/lanyard (elevated platforms above 6 ft.)	
	Electrical Shock	• De-energize or shut off utility lines at their source before work begins • Use double insulated or properly grounded electric power-operated tools • Maintain tools in a safe condition • Provide an equipment-grounding conductor program or employ ground-fault circuit interrupters • Use qualified electricians to hook up electrical circuits • Inspect all extension cords daily for structural integrity, ground continuity, and damaged insulation • Cover or elevate electric wire or flexible cord passing through work areas to protect from damage • Keep all plugs and receptacles out of water • Use approved water-proof, weather-proof type if exposure to moisture is likely • Inspect all electrical power circuits prior to commencing work • Follow Lockout-Tagout procedures in accordance with JV I policies	Lockout/Tagout Devices	Voltage Meter or ATic≅ Tracer

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Equipment/Facility Set-up (Continued)	Struck By/Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Warning vests, Hard hat, Safety glasses, Steel toe work boots	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. Maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists to exceed 85 dBA TWA	Ear plugs	Sound Level Meter
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment
Sampling Soil	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Sampling Soil (Continued)	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. Maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, vegetation, excavated material, and debris • Mark, identify, or barricade other obstructions		
	Inhalation and Skin Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin • Monitor breathing zone air to determine levels of contaminants • Follow proper procedures for handling/preserving/packaging/ labeling analytical samples; chemicals/preserving agents • Follow proper decontamination procedures to prevent ingestion of contaminants	Tyvek coveralls, latex or neoprene boots, nitrile gloves (see Section 5.0 HASP)	PID, Mini-RAM
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment
Excavation of Soil	Underground/ Overhead Utilities	• Identify all utilities around the site before work commences • Cease work immediately if unknown utility markers are uncovered • Use manual excavation within 3 feet of known utilities • Utility clearance shall conform with 29 CFR 1926.955 (high voltage >700 kv) 15 feet phase to ground clearance; 31 feet phase to phase clearance		

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Excavation of Soil (Continued)	Struck By/Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Warning vests, hard hat, safety glasses, steel toe work boots	
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	Ear plugs	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions		

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Excavation of Soil (Continued)	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin • Monitor breathing zone air to determine levels of contaminants • Dampen soil using light water spray to prevent fugitive dust emissions • Cover stockpiled soil with plastic sheeting to prevent fugitive dust emissions • Conduct air monitoring/sampling to determine exposure levels	Tyvek coveralls, nitrile gloves, neoprene boots	PID, Mini-RAM
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment
Screening Operations	Struck By/Against Heavy Equipment	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Warning vests, hard hat, safety glasses, steel toe work boots	
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	Ear plugs	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting)		

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
		• Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
Screening Operations (Continued)	Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions		
	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin • Monitor breathing zone air to determine levels of contaminants • Dampen soil using light water spray to prevent fugitive dust emissions • Cover stockpiled soil with plastic sheeting to prevent fugitive dust emissions • Conduct air monitoring/sampling to determine exposure levels	Tyvek coveralls, nitrile gloves, neoprene boots	PID, Mini-RAM
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment
Backfill and Compact Soils	Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, construction debris, and other materials • Mark, identify, or barricade other obstructions		
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Struck by/Against Heavy Equipment, Flying Debris, Protruding Objects	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Barricade or enclose the work area	Warning vests, Hard hat, Safety glasses, Steel toe work boots	

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
		• Restrict work area entry to authorized personnel only during construction activities • Wear hard hats, safety glasses with side shields, and steel-toe safety boots • Understand and review hand signals		
Backfill and Compact Soils (Continued)	Vibration	• Rotate compaction tasks to minimize work exposure to equipment vibration • Use compactors with vibration dampening devices	Anti-vibration gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	Ear plugs	Sound Level Meter
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment
Equipment Decontamination	Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, tools and debris • Mark, identify, or barricade other obstructions		
	Struck by/Against Heavy Equipment, Protruding Objects	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Warning vests, hard hat safety glasses, goggles and face shield, steel toe work boots	
	Inhalation and Contact with Hazardous Substances & Splashes	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin • Wear hard hats, safety glasses with side shields, or goggles with splash shields and steel-toe safety boots	PVC rain suit or Tyvek coveralls, nitrile or latex gloves, neoprene or latex boots (See Section 5.0 HASP)	

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Equipment Decontamination (Continued)	Burns	• Wear proper gloves, face shield/safety goggles, shin and toe guards, and splash suits to protect workers from skin burns and injury when operating laser (high pressure washers)	Goggles and face shield, shin and toe guards	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	Ear plugs	Sound Level Meter
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment
Site Restoration and Seeding	Struck by/Against Heavy Equipment, Protruding Objects	• Wear reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Wear hard hats, safety glasses with side shields, or splash/face shields and goggles, and steel-toe safety boots at all times • Understand and review hand signals	Warning vests, Hard hat, Safety glasses, Steel toe work boots	
	Slips, Trips, Falls	• Clear walkways of equipment, tools, debris, other materials • Mark, identify, or barricade other obstruction		

Job Safety Analysis for Site Preparation

Task Breakdown	Potential Hazards	Critical Safety Practices	Personal Protective Clothing and Equipment	Monitoring Devices
Site Restoration and Seeding (Continued)	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period) • Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	Ear plugs	Sound Level Meter
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. per person for manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with JV I policies • Provide fluids to prevent worker dehydration	Insulated Clothing (subject to ambient temperature)	Meteorological Equipment

Appendix B
Site Specific Accident Prevention Plan

Site-Specific Accident Prevention Plan
for
St. Juliens Creek Annex

Interim Remedial Action at Site 3

Chesapeake, Virginia

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No: N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Contents

1 Signature Sheets 1-1

2 Background Information 2-1

3 Statement of Safety and Health Policy 3-1

3.1 Corporate Policy Statement 3-1

3.1.1 Objective 3-1

3.1.2 Purpose 3-1

3.1.3 Primary Environmental Health and Safety Program Functions 3-1

3.1.4 Safety Organization and Responsibility 3-1

3.1.5 Regulator Compliance Policy 3-3

3.1.6 Safety Goals 3-3

3.1.7 Safety Training 3-3

3.1.8 Medical Surveillance 3-3

3.1.9 Accident Investigation 3-4

3.1.10 Position Statement on Modified Work 3-4

3.1.11 Field Safety Inspections 3-4

3.1.12 First Aid 3-4

3.1.13 Review of Health and Safety Statistics 3-4

3.1.14 Specific Written Safety Procedures/Permits 3-5

3.1.15 State, OSHA, and Other Regulations 3-5

3.1.16 Changes 3-5

4 Responsibilities and Lines of Authorities 4-1

5 Subcontractors and Suppliers 5-1

5.1 Subcontractor/Supplier Coordination and Control 5-1

5.2 Subcontractor/Supplier Safety Responsibilities 5-1

6 Training 6-1

6.1 Safety Indoctrination Subjects: 6-1

6.2 Mandatory Training and Certifications 6-1

6.3 Supervisory and Employee Safety Meetings 6-1

7 Safety and Health Inspections 7-1

7.1 Safety Inspections 7-1

7.2 External Inspections/Certifications 7-1

8 Safety and Health Expectations, Incentive Programs, and Compliance 8-1

8.1 Company Safety Program Goals 8-1

8.2 JV I Employee Safety Responsibility Requirements 8-1

8.3 Managers and Supervisors Safety Accountability 8-1

9 Accident Reporting 9-1

9.1 Exposure Data (Man-hours Worked) 9-1

9.2 Accident Investigations, Reports, and Logs 9-1

9.3 Immediate Notification of Major Incidents 9-1

10 Medical Support 10-1

11 Personal Protective Equipment 11-1

11.1 Hazard Assessment Procedures/Written Certifications for Personal Protective Equipment 11-1

12 Plans Required by the Safety Manual 12-1
12.1 Hazard Communication Program 12-1
12.2 Emergency Response Plans 12-1
12.3 Layout Plans 12-1
12.4 Respiratory Protection Plan 12-1
12.5 Lead Abatement Plan 12-1
12.6 Asbestos Abatement Plan 12-1
12.7 Abrasive Blasting 12-1
12.8 Confined Space 12-2
12.9 Hazardous Energy Control Plan 12-2
12.10 Critical Lift Procedures 12-4
12.11 Contingency Plan for Severe Weather 12-4
12.12 Access and Haul Rod Plan 12-4
12.13 Demolition Plan 12-4
12.14 Emergency Rescue (Tunneling) 12-4
12.15 Underground Construction Fire Prevention and Protection Plan 12-4
12.16 Compressed Air Plan 12-4
12.17 Form Work and Shoring Erection and Removal Plans 12-5
12.18 Lift Slab Plans 12-5
12.19 SSH 12-5
12.20 Blasting Plan 12-5
12.21 Diving Plan 12-5
12.22 Alcohol and Drug Abuse Prevention Plan 12-5

13 Contractor Information to Meet the Requirements of the Major Sections of EM-385-1-1 13-1

SECTION 1

Signature Sheets

Plan Prepared By:

Name: David R. Leadenham, Program Manager JV I
Title: Program Manager
Company: AGVIQ Environmental
Telephone: 757-318-9420
Fax: 757-318-9421

This Site Specific Accident Prevention Plan was prepared in part by:

Signature:

_____

David R. Leadenham, Program Manager

Designated Project Manager:

Name: David R. Leadenham, Program Manager JV I
Title: Project Manager
Company: AGVIQ Environmental
Telephone: 757-318-9420
Fax: 757-318-9421

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein.

Signature:

_____

David R. Leadenham, Project Manager

Designated Site Safety Officer:

Name: TBD
Title: Superintendent / Site Safety Officer
Company: JV I
Telephone:
Fax:

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein.

Signature:

_____

TBD, Superintendent / Site Safety Officer

Alternate Site Safety Officer:

Name: TBD
Title: Superintendent / Site Safety Officer (Alternate)
Company: JV I
Telephone:
Fax:

I hereby acknowledge that I have reviewed and fully understand the tenets of this Accident Prevention Plan and my responsibilities as they are specified herein.

Signature:

_____

TBD, Superintendent / Site Safety Officer

SECTION 2

Background Information

Background information for this project is detailed in the Site Specific Health and Safety Plan, Section 1.1, Introduction.

SECTION 3

Statement of Safety and Health Policy

3.1 Corporate Policy Statement

3.1.1 Objective

To provide a Safe Work Place for all employees by developing and administering an overall Environmental Health and Safety (EH&S) Program. To establish written policies and procedures that serve as vehicles through which the program will be implemented.

3.1.2 Purpose

This statement describes the JV I Health and Safety Program and the responsibilities of the supervisors, employees, and subcontractors. It will address applicable United States Occupational Safety and Health Administration (OSHA) standards set forth in 29 CFR 1910 and 29 CFR 1926 as well as various consensus standards and JV I policies by. the use of referenced procedures.

3.1.3 Primary Environmental Health and Safety Program Functions

The primary functions of the Environmental Health and Safety program are:

- Defining the health and safety responsibilities of JV I personnel
- Administration of the medical surveillance program
- Preparation of the site safety plans
- Providing safety training/maintaining training records
- Providing safety procedures and protocols to be used at project sites, shops, and offices
- Conduct accident investigations and maintaining records
- Verifying OSHA compliance under 29 CFR 1910 and 1926
- Providing guidance and assistance with preparation of safety protocols for specific tasks
- Promoting safety and health consciousness within the company
- Designating the functional organization of safety committees to serve corporate and project specific safety and health program needs

3.1.4 Safety Organization and Responsibility

With JV I, the safety and protection of employees, clients, and the community is the first priority. This concern for safety is not restricted to field operations but extends to laboratories, the offices, and shop facilities. If an activity or condition is unsafe, the task will not proceed until the situation is corrected.

The Company President is the primary operational safety official in the company.

The Corporate Operations Manager (COM) administers the safety program for JV I and reports directly to the company president. The COM, or his designee, is responsible to support and assist site supervisors in executing the Environmental Health and Safety Program.

The Site Safety Officer (S SO) is responsible for administration and enforcement of the safety procedures and protocols on project sites. The SSO is the primary safety official at the working level. The responsibility for safety is delegated and shared by project managers, alternate site safety officers, and subcontractors' supervisors. At a minimum, the SSO must perform, or otherwise supervise the performance of, the following:

- Motivate employees and supervisors of subcontractors to adhere to TMS's safety policy in each work situation.
- Schedule, organize, and lead preparatory phase meetings prior to all activities relevant to definable features of work and have a working knowledge of the safe procedure for all jobs and tasks under their supervision. When in doubt, they shall seek assistance prior to initiating a task. This is the only acceptable manner in which to perform the task. If the task cannot be accomplished safely, it will not be attempted.
- Explain the safety procedure involved with a task to each employee and check frequently to see that the employee understands and works as instructed.
- Allocate sufficient time for the training and coaching of all employees to insure that everyone knows the correct procedure for safely accomplishing required tasks. New employees will not be allowed to perform any k until required training is completed.
- Immediately correct unsafe conditions that involve JV I employees or subcontractors.
- Ensure that employees are outfitted with and wear personal protective equipment as specified by this plan, EM385-1-1, and other JV I procedures.
- Set a good safety example.
- Obtain the cooperation of employees and sub-contractors. Sub-contractor safety performance records will be verified prior to contract award and will be continually monitored during operations.
- Report all accidents, near misses and property damage in accordance with the Incident Management and Reporting Procedure.

Every Employee, regardless of job title, shares the responsibility for safety and should report any unsafe work condition without fear of reprisal. It is imperative that employees observe the following minimum requirements in order to achieve a safe and healthy workplace:

- Each employee must be familiar with this Accident Prevention Plan and the general safety rules herein.
- Each employee shall practice safe procedures and follow all. safety rules and regulations for the successful completion of any job task.
- All employees shall wear the necessary personal protective equipment required for the job or task as specified by this plan, EM385-1-1, and other JV I procedures.
- The employee shall notify the immediate supervisor of any potential hazard or unsafe work practice that could result in injury or destruction of property.

- The employee shall report all accidents to an immediate supervisor regardless of whether injury or property damage resulted. This includes all near misses (accidents without injury or damage). This requirement serves to bring unsafe conditions to the attention of management.
- Each employee shall be subject to contraband search for safety purposes and for the safety of fellow employees.
- Violations of published safety policies and procedures may be cause for disciplinary actions up to and including dismissal.
- All employees who are taking prescribed medications that could affect work performance or might alter the manner in which they could be treated in an emergency shall so advise their supervisor prior to beginning work.

3.1.5 Regulator Compliance Policy

The policy of JV I will be to comply with all federal, state, local, and client regulations. It is the responsibility of all personnel to perform all work in full compliance with appropriate regulations. Safety and health personnel will immediately bring any condition regarding safety and health compliance to the attention of supervisory operating personnel.

JV I will insure regulatory compliance by all of its subcontractors, including OSHA 200 forms, safety records, OSHA training, and medical surveillance, when applicable.

3.1.6 Safety Goals

The goal of the safety and health program is to ensure a safe working environment, protect workers from harm, and protect the company from liability associated with an unsafe working environment.

Other goals are to eliminate workplace accidents, gain worker acceptance through cooperation and training, and provide our clients with a responsible, well-trained, safety-oriented work force.

JV I has adopted a “zero accidents” goal for all operations. All activities will be planned and performed with this goal foremost.

3.1.7 Safety Training

JV I engages in environmental remediation, construction, and other services, and must comply with numerous health and safety training requirements, mandated by governmental agencies, clients, and internal policies.

All personnel will be provided sufficient training to execute their jobs in a safe and healthy manner.

Direct supervisors are responsible to determine the training requirements of a task and ensure employees have the necessary training to complete the task safely. Environmental health and safety personnel will assist with this determination and training.

The corporate personnel department will maintain training records and documentation.

3.1.8 Medical Surveillance

All employees who perform work at hazardous waste sites or perform emergency response will be subject to the JV I medical surveillance program. This program conforms to the requirements established by 29 CFR 1910.120/1926.65 (f) Medical surveillance and is titled EH&S Procedure 3-1, Occupational Health Examination Program.

3.1.9 Accident Investigation

All accidents will be thoroughly investigated by the supervisor of the person(s) involved in the accident. The employee and the site supervisor will forward a signed copy of the accident investigation form to the corporate health and safety office to comply with JV I requirements.

The COM may investigate serious accidents, such as those involving hospitalization or injuries requiring more than one visit to a physician. The COM may also request that a specific written accident investigation be conducted in case of an unusual or serious injury or accident.

3.1.10 Position Statement on Modified Work

JV I will attempt t eliminate all accidents through strict compliance with OSHA regulations and JV I health and safety procedures, as well as supervisor and employee safety training, safety audits, and constant attention to safety. Should employee be injured or become ill in the course of and arising from his employment, JV I will attempt to provide modified work. Modified work (light duty) will be made available in order to bring the injured employee back to the work environment, for the benefit of the employee and the company, whenever medically appropriate.

Employees are expected to return to modified work when medically capable. The work assigned to the injured employee will meet the restrictions set forth by the treating and/or company physician. Examples of modified work include but are not limited to office work, dispatching, and light shop work.

3.1.11 Field Safety Inspections

Weekly safety inspections will be made of the work area. The inspection will be made by the Project Manager and/or the SSO, or a designated representative. These inspections are in addition to the daily inspections to be held by the SSO and crew leaders. Discrepancies found during inspections will be corrected as soon. as practicable. Serious safety violations will be corrected immediately. Inspection records will be maintained in the safety log.

Additionally, the COM or his designated representative may make periodic unannounced inspections of work sites on their own discretion or at the request of an employee, supervisor, manager, or client.

3.1.12 First Aid

Each facility and work location must be evaluated to determine the potential requirement for medical emergencies. At a minimum, an industrial first-aid kit will be provided. An adequate number of employees with current certification in first aid and cardiopulmonary resuscitation (CPR) will be maintained on the project sites.

The SSO shall ensure that emergency medical attention is readily available. For emergency response and remediation operations, the SSO shall establish the requirement for medical emergency response and identify an emergency medical facility with chemical contamination trauma capability. If site conditions require, a subcontract emergency medical technician (EMT) and/or the availability of ambulance service on site will be implemented.

3.1.13 Review of Health and Safety Statistics

A designated representative from JV I will review and tabulate safety statistics as necessary:

- OSHA 200 form
- Workers' Compensation Experience Modification Ratings

3.1.14 Specific Written Safety Procedures/Permits

In order to provide a safe work place and communicate specific work requirements for regulatory compliance, specific tasks are incorporated by reference to this procedure. These procedures deal with specific areas such as confined space, hot work, lock out tag out, etc.

All JV I personnel who may be subject to these procedures will receive appropriate training and will be held accountable for compliance with procedure requirements.

3.1.15 State, OSHA, and Other Regulations

Where state regulations differ from federal regulation cited in this manual, the more stringent regulation will apply.

3.1.16 Changes

Any user of this plan is welcome to recommend changes. Changes normally result from finding errors, regulatory changes, equipment modification, new equipment purchases, and changes to operation procedures or site conditions. The format for making a recommended change is:

Submit a written recommendation to the COM via your immediate supervisor. The COM will review the recommendation.

After review, the COM will determine if the suggestions should be included as an amendment or new procedure in this plan. Changes to this plan will be distributed immediately upon approval.

SECTION 4

Responsibilities and Lines of Authorities

The following listed JV I personnel shall have the authority to intervene and suspend work in the interest of safety policy compliance;

a.	David Leadenham	Program Manager
b.	Lee J. Kellam	Deputy Program Manger
c.	William Friedmann	QC Representative
d.	TBD	Superintendent/Site Safety Officer

Safety responsibilities, accountability and lines of authority are further discussed in Section 2.1 of the SSHASP, Project Safety Responsibilities.

SECTION 5

Subcontractors and Suppliers

5.1 Subcontractor/Supplier Coordination and Control

JV I subcontractors will be screened for safety performance and compliance with Federal Alcohol and Drug testing requirements prior to being issued any contract for site work. JV I subcontractors will comply with the requirements for site safety as outlined in JV I health and Safety Procedures.

5.2 Subcontractor/Supplier Safety Responsibilities

All subcontractor employees are subject to the same training and medical surveillance requirements as JV I personnel depending on job activity. All activities involving the potential for exposure to hazardous waste materials will require medical and training certification as mandated by 29 CFR 1910.120. All subcontractor personnel will be required to sign in daily and be required to attend a daily meeting discussing operations and safety issues. All subcontractors involved in construction/remedial activities will complete a Subcontractor Pre-Job Safety Checklist prior to the start of work at the site. Subcontractors will submit Activity Analyses for their work activities to the JV I SSO. The subcontractor reports directly to the JV I Project Manager. All incidents involving subcontractor employees shall be reported to the JV I Site Safety Officer and a copy of the subcontractor's injury/illness report shall be submitted to the JV I SO within 24 hours.

JV I subcontractors are required to sign off and comply with all requirements of the JV I Site-Specific Health and Safety Plan, which includes this Accident Prevention Plan, Hurricane Preparedness Plan. Plans to address specific hazards may be added to the APP by during the course of work. JV I subcontractors will be required to sign off and comply with any such supplemental plans. Contractors not in compliance will be immediately dismissed from the site.

Suppliers delivering various materials to the project site or providing equipment/equipment maintenance will comply with all rules and regulations specified by the owner. Supplier personnel will not be permitted into contaminated areas unless training and medical surveillance is in accordance with 29 CFR 1910.120. Contractors will not ride on tractors, forklifts or similar vehicles unless specific seats are provided. They will follow Facility hot work rules if hot work is required for vehicle or equipment maintenance. Trucks will be loaded and unloaded in a safe and effective manner and materials will be stored safely in designated locations only. Associated packaging will be properly disposed of and litter will not be permitted to be scattered or blown from truck beds. Operators of mobile equipment on site must observe all traffic rules such as speed limits and right-of-ways of pedestrians.

SECTION 6

Training

6.1 Safety Indoctrination Subjects:

Outlines of the site safety orientation for JV I and subcontractor personnel and visitors are provided in Section 9.0 of the SSHASP, Training Requirements.

6.2 Mandatory Training and Certifications

Mandatory training and certifications are discussed in Section9.0 of the SSHASP, Training Requirements.

All personnel entering an exclusion zone will be trained in the provisions of this Accident Prevention Plan and be required to sign the Accident Prevention Plan. Site-specific training for Site 22 is included in Section 9.0 of the SSHASP, Training Requirements.

6.3 Supervisory and Employee Safety Meetings

The JV I SSO will conduct daily safety meetings 'at the start of each work shift for on site personnel and will require subcontractors to follow similar meeting procedures or participate in the JV I daily safety meetings.

SECTION 7

Safety and Health Inspections

7.1 Safety Inspections

The JV I Project Manager and Site Safety Officer are required to perform site safety inspections using the Site Safety Inspection Checklist. The SSO is responsible for conducting and preparing reports of daily safety inspections of work processes, site conditions, equipment conditions and submitting them for the project record. The SSO will discuss any necessary corrective actions with the PM and review new procedures. Copies of these reports are maintained on file at the project locations. Additionally, copies will be forwarded to the program COM.

The JV I Safety Manager or his designated representative will periodically conduct site visits and perform Site Safety Assessments. These reports are kept on file and are tracked in a database for each -Project Manager and Supervisor/ Superintendent, including the number of action items noted during the visit and written confirmation of the corrective actions for each item. These responses are compiled and provided to program management for review.

7.2 External Inspections/Certifications

JV I does not anticipate, but may consider the use of, outside sources to provide safety inspections on an as necessary basis.

As required, JV I safety equipment will comply with appropriate OSHA (Occupational Safety and Health Administration), NIOSH (National Institute for Occupational Safety and Health), ANSI (American National Standards Institute), ASTM (American Society for Testing and Materials), and US Coast Guard or other recognized certification organizations.

SECTION 8

Safety and Health Expectations, Incentive Programs, and Compliance

8.1 Company Safety Program Goals

JV I considers safety the highest priority during work at all project sites and it's business offices and has established a goal of **zero incidents.** All projects will be conducted in a manner which minimizes the probability of near misses, equipment/property damage or injury. JV I will establish programs to recognize people and projects that demonstrate excellence in safety performance. JV I will use safety observation programs to identify and correct unsafe acts and conditions. Safety awareness programs will be used to provide continuous training and development of good safety practices. JV I site supervision will investigate all incidents to determine root causes and institute corrective actions to prevent recurrence. JV I will provide and enforce safety rules to protect employees, subcontractors, clients and the public. Project managers and superintendents that demonstrate superior safety performance will be rewarded.

8.2 JV I Employee Safety Responsibility Requirements

Each employee is responsible for personal safety as well as the safety of others in the area and is expected to participate fully in the ***Safety Improvement Process,*** particularly the Safety Observation Program. The employee use all equipment provided in a safe and responsible manner as directed by the SSO. All JV I personnel will follow the policies set forth in the JV I Health and Safety Plan. Site personnel concerned with any aspect of health and safety shall bring it to the attention of the PM or SSO. All project personnel have the authority to stop work if it is their judgement serious injury could result from continued activity. The SSO shall be notified immediately if this becomes necessary. To protect the health and safety of all personnel, employees that knowingly disregard safety policies/procedures may be subject to disciplinary actions up to and including termination.

8.3 Managers and Supervisors Safety Accountability

It is the duty of the first line supervisor to motivate employees to adhere to JV I's safety policy in each work situation. A first line supervisor for these purposes is defined as that person designated to give immediate on-site supervision to personnel involved in a task.

All supervisors shall have complete knowledge of the safe procedure for all jobs and tasks under their supervision. When in doubt, they shall seek assistance prior to initiating a task. This is the only acceptable manner in which to perform the task. If the task cannot be accomplished safely, it will not be attempted.

Supervisors will:

- Explain the safety procedure involved with a task to each employee and check frequently to see that the employee understands and works as instructed.
- Allocate sufficient time for the training and coaching of all employees to insure that everyone knows the correct procedure for safely accomplishing required tasks.

- Prevent new employees from performing any tasks until required training is completed.
- Immediately correct unsafe conditions, which involved JV I employees or contractors.
- Ensure that the employees are outfitted with and wear personal protective equipment as specified by this APP, site-specific health and safety plan, other JV I procedures or as directed by the COM, PM, SSO, or CIH.
- Set a good safety example.
- Obtain the cooperation of employees and contractors.
- Provide a safe work environment for employees and contractors.
- Confirm contractor safety performance records have been verified prior to contract award and monitor contractor performance during operations.
- Report all accidents, near misses and property damage in accordance with the Incident Management and Reporting Procedure.
- Establish a safety culture, using the elements of the JV I Safety Improvement -process, which promotes awareness, encourages participation and recognizes excellence.

SECTION 9

Accident Reporting

9.1 Exposure Data (Man-hours Worked)

The JV I COM with assistance from the JV I designated responsible partner tracks and maintains incident records as to Federal reporting requirements (OSHA 200 Log). Incident Rates and Workers Compensation losses are tracked for each Project, Project Manager and Site Supervisor.

9.2 Accident Investigations, Reports, and Logs

The Site Safety Office conducts accident/incident investigations. A report is completed by the SSO and is required to be reviewed and signed by the Project Manager. The report must be submitted to the COM within 24 hours.

9.3 Immediate Notification of Major Incidents

JV I will immediately notify the ROICC of any major incident, including injury, fire, equipment/ property damage and environmental incident. A full report will be provided within 48 hours. Procedures to be followed in response to any major personal injury are detailed in the Site Specific Health and Safety Plan, Section 8.7.1.1, Response.

SECTION 10

Medical Support

On-site Medical Support/Off-site Medical Arrangements are provided in Section 8.0 of the SSHASP. Emergency phone numbers are listed in Table 8.2 in Section 8.2, Emergency Recognition and Prevention.

SECTION 11

Personal Protective Equipment

11.1 Hazard Assessment Procedures/Written Certifications for Personal Protective Equipment

Protection levels provided in the SSHASP have been established for the anticipated scope of work Once on-site, results of air monitoring and visual inspection of the work activities may indicate the need for changes in these PPE level(s). Any significant change in the PPE level will be approved by the SSO in consultation with the PM, CIH and/or COM. Personal Protective Equipment (PPE) selection criteria are outlined in the SSHASP, Section 5.0, Protective Equipment.

All personnel using respiratory protection will be cleared by a physician for use of a respirator and will be fit-tested to assure they can achieve an acceptable fit.

SECTION 12

Plans Required by the Safety Manual

12.1 Hazard Communication Program

The Site-Specific Hazard Communication Program is included Section 3.2 of the SSHASP. JV I Hazard Communication Program complies with 29 CFR 1926.59/1910.1200.

12.2 Emergency Response Plans

The Site-Specific Emergency Response and Contingency Plan is included in Section 8.0 of the SSHASP.

12.3 Layout Plans

Site delineation including work zones and sketches are included with the SS Work Plan. This plan may be modified upon release of the Project Specification.

12.4 Respiratory Protection Plan

The primary objective of respiratory protection is to prevent employee exposure to atmospheric contamination. When engineering measures to control contamination are not feasible, or while they are being implemented, personal respiratory protective devices will be used.

The criteria for determining respirator need have been evaluated based on the site contaminants; expected levels of protection are outlined in Section 5.1. Air monitoring will be conducted to confirm that respiratory protection levels are adequate (see Section 7.0 SSHASP). All respirator users will be OSHA trained in proper respirator use and maintenance. The SSO and crew leaders will observe workers during respirator use for signs of stress. The SSO, PM, CIH, and COM will also evaluate the implementation of the SSHASP, periodically, to determine its continued effectiveness with regard to respiratory protection. All persons assigned to use respirators will have medical clearance to do so.

12.5 Lead Abatement Plan

Not Applicable.

12.6 Asbestos Abatement Plan

Not Applicable.

12.7 Abrasive Blasting

Not Applicable.

12.8 Confined Space

Confined Space Entry Procedures will be available if required.

12.9 Hazardous Energy Control Plan

This program establishes lockout practices of energy sources that could cause injury to personnel involved at the work site. The lockout program covers all employees and outside contractors affected by the cleaning, repairing, servicing and adjusting of prime movers, machinery, and equipment. Only authorized employees shall perform such work.

a. Authorized employees shall be instructed in lockout/tagout procedures by their supervisor. Each new or transferred employee shall be instructed by the supervisor in lockout procedures. A sufficient number of tags and padlocks shall be supplied. During each phase of construction, a representative from JV I will be present while the electrical supervisor begins the lock out/tag out process.

b. All equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy-isolating device bearing a lock.

c. Documented periodic inspections shall be made periodically by supervisors to ensure that each procedure is being properly followed. The SSO will insure these inspections are being performed and keep on record the inspection reports on the job site. The inspection must include a review addressing the employee's responsibilities. Documentation is to include the date of the inspection, equipment on which the procedure was being utilized, the employees involved, and the person performing the inspection.

d. Authorized employees shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source may be involved. Any questionable identification of sources shall be cleared through the supervisors.

e. To begin the lockout process, use the following items as a guide. If for any reason the following items are in question, contact your immediate supervisor before moving forward. If more than one individual is required to lock out equipment, each person shall place his own personal lock on the energy isolating device(s). One authorized individual and a competent person from the prime contractor (JV I) with the knowledge of the crew, may lock out equipment for the whole crew. In such cases, it is the responsibility of the individual to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. Additionally, the authorized individual shall not remove a crew lock until it has been verified that all individuals are clear and a prime contractor competent person is present.

    (1) Notify all affected employees that a lockout is required.

    (2) If the equipment is operating, shut it down by the normal stopping procedure.

    (3) Operate the switch, valve, or other energy isolating devices so that the energy source(s) is disconnected or isolated from the equipment.

(4) Stored energy, such as capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

(5) Lockout energy isolating devices with an assigned individual lock. A second lock will be used if possible by the superintendent.

(6) After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating controls to the neutral position after the test.

(7) Attach a completed accident prevention tag and/or sign on the controls of the machine. The identification tag and/or sign will be coordinated with the electrical contractor and the prime contractor. A JV I representative will then make known to the facility personnel affected by this operation to familiarize them with the identification of these tags or signs and the procedures in which the contractors will be working by, and the point of contact of the electrical supervisor.

(8) The equipment is now locked out.

f. To restore equipment to service, use the following items as a guide. If for any reason the following items are in question, contact your immediate supervisor before moving forward.

(a) When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed.

(b) When equipment is clear, remove all locks. The energy isolating devices may be operated to restore energy to the equipment. There must be a supervisor from the electrical contractor and the prime contractor present.

g. The following checklist for lockout training is a minimum requirement to provide to new employees. The supervisors must sign, date, and retain in their own records this information. The supervisor must also delivery a copy of this training to the Site Safety Officer.

(a) Explain the significance of why a machine is locked or tagged out.

(b) Explain what an employee is to do (and not do) when encountering a tag or lock on a switch or device they want to operate.

(c) Explain the importance of notification of affected employees.

(d) Show the employee the location of all locks, tags, and lockout devices.

(e) Explain how to recognize the applicable hazardous energy sources.

(f) Explain the type(s) and magnitude of energy to be isolated on the machinery and how to control that energy.

(g) Explain the proper sequence of locking out.

h. All utility outages will follow the contract specifications, EM 385-1-1 and OSHA standards. The contractors will follow the above information as well as the following:

(a) The contractor will supply the required tags and/or locks for each utility outage.

(b) PWC Utility outages will be conducted with PWC Utilities, ROICC, the Contractor and sub-contractor.

(c) Interior building/ facility utility outages will be coordinated with Facility Manager, ROICC, the Contractor and sub-contractor.

(d) A preparatory meeting will be held prior to all electrical work and utility outages, this meeting will also cover any safety issues that may pertain to the scope of work. The Activity Hazard Analysis will be reviewed and any additional concerns will be annotated on this form.

12.10 Critical Lift Procedures

Not Applicable.

12.11 Contingency Plan for Severe Weather

Contingency plans for severe weather are included in Section 8.0 and Appendix C. of the SSHASP, Hurricane Preparedness Plan.

12.12 Access and Haul Rod Plan

Site delineation, sketches, and traffic control are defined in the SS Work Plan.

12.13 Demolition Plan

Demolition activities are detailed in the SS Work Plan.

12.14 Emergency Rescue (Tunneling)

Not Applicable.

12.15 Underground Construction Fire Prevention and Protection Plan

Not Applicable

12.16 Compressed Air Plan

Not Applicable

12.17 Form Work and Shoring Erection and Removal Plans

Not Applicable

12.18 Lift Slab Plans

Not Applicable

12.19 SSH

The JV I Site Specific Health and Safety Plan is included with this submission.

12.20 Blasting Plan

Not Applicable

12.21 Diving Plan

Not Applicable

12.22 Alcohol and Drug Abuse Prevention Plan

JV I substance abuse procedures are on file.

SECTION 13

Contractor Information to Meet the Requirements of the Major Sections of EM-385-1-1

In addition to this Accident Prevention Plan, JV I has prepared a Site-Specific Health and Safety Plan to meet the major requirements of USACE Manual 385-1-1.

Appendix C
Hurricane Preparedness Plan

Hurricane Preparedness Plan
for
St. Juliens Creek Annex

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No: N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Contents

1 Introduction 1-1
1.1 Purpose 1-1
1.2 Scope 1-1
1.3 Discussion 1-1

2 Definitions 2-1

3 Responsibilities 3-1
3.1 Project Manager - TBD 3-1
3.2 Site Superintendent - TBD 3-1
3.3 Site Health and Safety Specialist (or Designee) - TBD 3-1
3.4 Quality Assurance/Quality Control - TBD 3-1

4 Normal Operating Procedures 4-1

5 Emergency Operating Procedures 5-1
5.1 Condition V—Early Preparedness 5-1
5.2 Condition IV—(destructive winds are possible within 72 hours 5-1
5.3 Condition III—Tropical Storm Warning (destructive winds are possible within 48 hours) 5-2
5.4 Condition II—(destructive winds are anticipated within 24 hours) 5-2
5.5 Condition I—(destructive winds are anticipated within 12 hours) 5-3
5.6 Resume Site Operations 5-3

6 Debriefing 6-1

Appendix A – Contact List for Additional Assistance

SECTION 1

Introduction

1.1 Purpose

This procedure outlines the general responsibilities and actions to be taken in preparation for and response to a hurricane watch, hurricane warning, or hurricane on all CCI Navy Rac Contract Task Orders during hurricane season. Hurricane season is from 1 June to 30 November. All personnel should understand that predicting the occurrence and path of a hurricane is difficult, however the risk can be minimized and controlled by the procedures in this plan.

1.2 Scope

This procedure is applicable to all contractor personnel, including temporary construction facilities and remediation equipment present at any CCI Navy Rac Contract Task Order sites.

1.3 Discussion

This procedure provides information on how to protect personnel and property in the event of a hurricane. It is very difficult to determine with 100% accuracy whether a hurricane will actually hit the area until a few hours before landfall. The following table demonstrates that the accuracy of forecasting where a hurricane landfall will occur is very low more than 24 hours in advance of a storm.

Hours Before Landfall	Maximum Probability Values
72 Hours	10 Percent
48 Hours	13-18 Percent
36 Hours	20-25 Percent
24 Hours	35-45 Percent
12 Hours	60-70 Percent

SECTION 2

Definitions

The following definitions apply to various terms used in this document.

Conditions of Readiness (CORS):

Condition V - Destructive winds are possible at a CCI CTO within 96 hours. Maintain normal daily jobsite cleanup and good housekeeping practices.

Condition IV – (Sustained winds of 93 km/hr (50 knots) or greater expected at CCI CTO within 72 hours. Maintain normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers, scrap lumber, waste material, and rubbish for removal and disposal at the end of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than (4 feet) high. Remove all trash, debris or objects that could become missile hazards. Contact the ROICC for Condition requirements, updates, and completion of additional required actions.

Condition III – (Sustain winds of 93 km/hr (50 knots) or greater expected at CCI CTO within 48 hours. Maintain **Condition IV** requirements and commence securing operations necessary for **Condition I**, which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Begin collecting and stowing all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to **Condition II** and continue action as necessary to attain **Condition III** readiness. Contact ROICC for weather and COR updates and completion of additional required actions.

Condition II – (Sustained winds of 93 km/hr (50 knots) or greater expected at CCI CTO within 24 hours. Curtail or cease routine activities until securing operations are complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment and materials, or remove from jobsite. Expend every effort to clear all missile hazards and loose equipment from the jobsite. Contact the ROICC for weather and COR updates and completion of additional required actions.

Condition I – (Sustained winds of 93 km/hr (50 knots) at CCI CTO within 12 hours. Perform and complete all remaining actions required for lower conditions of readiness. Secure the jobsite and leave the government premises.

Destructive Winds - Generally winds reaching or exceeding the force of a tropical storm ($\geq$ 39 mph or 34 knots). Winds from any storm system (tropical or otherwise) that are determined to have the potential to cause property damage or personal injury which would warrant CCI to initiate a Condition IV alert.

Hurricane Watch - An announcement for specific areas where a hurricane or an incipient hurricane poses a possible threat to a coastal area, generally within 36 hours.

Hurricane Warning - A warning that sustained winds of 75 MPH (64 knots) or higher, associated with a hurricane are expected in a specified coastal area in 24 hours or less.

Hurricane - A tropical cyclone in which the maximum sustained surface wind is 64 knots (75 MPH) or greater.

Missile Hazard - Any object that may become airborne during high winds.

ROICC – Navy Resident Officer in Charge of Construction

Severe Weather - Any storm of tropical or non-tropical origin that has the capacity to produce destructive winds

Storm Surge - An abnormal rise in sea level accompanying a hurricane or other intense storm, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the storm.

Storm Tide - The actual sea level resulting from the astronomical tide combined with the storm surge. This term is used interchangeably with "Hurricane Tide."

Tropical Depression - A tropical low pressure system in which the maximum sustained surface wind is 33 knots (38 MPH) or less.

Tropical Storm - A tropical low pressure system in which the maximum surface wind ranges from 34 to 63 knots (39 to 73 MPH) inclusive. This is the strength at which the National Hurricane Center applies a name to the storm.

Tropical Storm Watch - Tropical storm conditions pose a threat to a coastal area generally within 36 hours.

Tropical Storm Warning - A warning for tropical storm conditions with sustained winds within the range of 39 to 73 MPH which are expected in a specified coastal area within 24 hours or less.

SECTION 3

Responsibilities

3.1 Project Manager - TBD

The Project Manager(PM) is responsible for ensuring that all adequate measures have been taken to prepare for hurricanes and to protect CCI site personnel and property in the event of a hurricane. The PM will ensure that ample resources are available to implement this plan and that all personnel are aware of this plan and their responsibilities.

3.2 Site Superintendent - TBD

The Site Superintendent (SS) or project manager will communicate all hurricane information to site personnel, and keep the site personnel continually informed of the measures to be taken. The SS is responsible for the coordination and direction of site equipment shut-down and will oversee the preparation of site facilities for any imminent storm. The SS will oversee the coordination of both pre and post storm operations and will ensure that the proper material, equipment, and supplies are utilized to implement this procedure.

3.3 Site Health and Safety Specialist (or Designee) - TBD

The Site Health and Safety Specialist will monitor weather information, including the National Weather Service probability values for landfall. The SHSS will maintain the necessary emergency supplies, and will periodically tour the site to ensure that proper steps are being taken to protect site personnel and property. The SHSS will assure that emergency contact list is posted in a prominent area in the office trailer.

3.4 Quality Assurance/Quality Control - TBD

The on-site Quality Assurance/Quality Control Manager will review implementation of this plan to assure conformance to its procedures.

Note: When personnel identified in Section 3.0 leave the site, they are responsible for notifying the Project Manager of a designated back-up person. The back-up person will be instructed in their responsibilities in the event of a hurricane.

SECTION 4

Normal Operating Procedures

The site will continuously conduct major housekeeping efforts to minimize the potential for loose material, equipment, etc., being stored at the site. At least one tailgate safety meeting will be held each month at all CCI CTO locations (June through November) to discuss:

- Hurricane safety
- Safety of employees and their families
- Site evacuation
- Review of this procedure

The SHSS will monitor the weather systems as they develop. If a hurricane is in the area, a daily report from the National Weather Service will be posted in the office trailer. The SHSS will inform the PM and SS of all storms reaching the level of a tropical storm (see definition), as defined by the National Weather Service.

SECTION 5

Emergency Operating Procedures

5.1 Condition V—Early Preparedness

The SHSS will notify the PM and SS when a tropical storm has been named and/or any severe weather has the potential to produce destructive winds at CCI CTO within 96 hours. This will initiate Condition of Readiness (COR) Condition V. This phase will continue until:

- The storm or condition is downgraded
- The storm track poses no threat to the site
- Condition IV begins

During Condition V, the progress of the storm will be monitored and tracked. The ROICC will be contacted at least twice daily for Condition Requirements updates and to inform him of completion of required actions for Condition V.

5.2 Condition IV—(destructive winds are possible within 72 hours

This COR starts when CCI is notified by the ROICC that severe weather is within 72 hours of posing a threat to the project location. The SHSS will ensure that the following steps are taken:

- Monitor the storm and inform the PM and SS of its progress
- Check PPE supplies and equipment to determine if any shipments are required or if pending shipments should be advanced or postponed

During Condition IV, the progress of the storm will be continuously monitored and tracked. The SS will instruct site personnel to begin general cleanup of all loose materials which may pose a hazard during high winds or rain. This will include removal of all debris, trash, and other debris that may become missile hazards. All form lumber will be stacked in neat piles less than 4 feet high. The ROICC will be contacted at least twice daily for Condition Requirements updates and to inform him of completion of required actions for Condition IV.

The SS will keep all site personnel advised of the status of the storm and site preparation activities. Due to the urgency and amount of work involved in preparing for a threatening storm, all construction operations which might interfere with securing operations will cease.

The SS will ensure that the following steps are taken:

- Fill fuel tanks in all equipment on-site
- Secure loose material on-site or in Q Area storage shed.
- Review requirements for Condition II with all crew members.
- Maintain condition IV requirements.

5.3 Condition III—Tropical Storm Warning (destructive winds are possible within 48 hours)

This COR starts when severe weather places the project site under a tropical storm warning. Condition III activities will also start if a threatening tropical storm is upgraded to a hurricane, or a severe storm approaching CCI CTO has generated destructive winds in other locations. The PM, SS, and SHSS will determine when to cease all operations based upon current weather conditions and/or as directed by the ROICC. If the storm or Condition is downgraded, the PM, SS, and SHSS will meet with or contact the ROICC to decide if a downgrade of the COR is appropriate. Actions for Condition III will be maintained and the following shall also be completed:

- Machinery, tools, equipment, and materials will be secured or removed form the site.
- Take actions to secure jobsite necessary for Condition I that cannot be completed within 18 hours.

5.4 Condition II—(destructive winds are anticipated within 24 hours)

Condition II begins when destructive winds are anticipated within 24 hours and/or as directed by the ROICC. The PM, SS, and SHSS will determine when to demobilize from the site based upon weather conditions. During this phase:

The SS will:

- Secure machinery, tools, equipment and materials or remove them from the jobsite.
- Conduct a roll call of personnel on-site and inform the SHSS
- Notify personnel, on leave, of schedule changes
- Personnel needing to leave the project to attend to personal matters will notify their SS immediately.
- Valuable records, files, and equipment will be boxed in preparation for movement to a safe location.

The SHSS will ensure that the following step is taken:

- All visitors from the site are evacuated.
- Make a final site walk-through to determine that the site is secure and clear all missile hazards from the jobsite.
- Inform the Project Manager that all personnel are being released from the site.

The QA/QC Manager will:

- Ensure that all procedures are followed according to this plan

If the storm or Condition is downgraded, the PM, SS, and SHSS will meet to decide if a downgrade of the phase is necessary.

5.5 Condition I—(destructive winds are anticipated within 12 hours)

- Complete all remaining actions required for lower conditions of readiness.
- Secure jobsite access and evacuate to safe refuge.

5.6 Resume Site Operations

The PM will contact the ROICC to determine when site operations will resume. Although the hurricane/severe weather has passed, hazards may still exist because of water damage, other hazardous conditions, dangers from electric shock, poisonous snakes, etc.

The SHSS will conduct a damage survey with the PM and SS. Photographs of the storm damage at the site will be taken by the QA/QC Manager. They will develop a prioritized recovery plan from the survey findings. Subsequently, all site personnel will be notified when it is safe to return to work. Required personnel and subcontractor expertise will be mobilized to the site to repair any damaged equipment.

SECTION 6

Debriefing

Following the return to work of site personnel, the Site Supervisor will conduct a debriefing with site personnel. The debriefing will accomplish the following objectives:

- Finalize a recovery plan
- Review the Hurricane Plan for effectiveness
- Suggest and agree on improvements to the plan
- Incorporate plan changes

When completed, the SS and/or SHSS will meet with site personnel to discuss any corrective actions or changes in this plan.

APPENDIX A

Contact List for Additional Assistance

The following references may be consulted for additional guidance on hurricane preparedness and response.

Angelo Liberatore, CIH, CSP
CCI/HSM/ATL
Aliberatory@ch2m.com
770-604-9095 Ext. 592

Richard Rathnow, CIH, CSP
SER/HSM/ORO
Rrathnow@ch2m.com
865-483-9005 Ext. 572

Appendix C
Erosion and Sediment Control Plan

Erosion and Sediment Control Plan
Interim Remedial Action (Phase II)
at Site 3
St. Juliens Creek Annex
Chesapeake, Virginia

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No. N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

VIRGINIA BEACH, VIRGINIA

Contents

1 Introduction 1-1
1.1 Site Background 1-1
1.2 Objectives and Scope of Work 1-2
1.3 Project Schedule 1-2
1.4 Document Usage 1-2

2 Erosion and Sediment Controls 2-1
2.1 Existing Drainage Features 2-1
2.2 Specific E&S Control Measures 2-1
2.2.1 Silt Fence 2-1
2.2.2 Hay Bales 2-1
2.2.3 Removal of Loose Soils 2-2
2.3 Severe Weather 2-2

Figures

1-1 Base Location Map

1-2 Site Location Map

2-1 Site 3 Work Zone

Standards and Specifications

3.01 Safety Fence

3.02 Temporary Stone Construction Entrance

3.03 Construction Road Stabilization

3.04 Straw Bale Barrier

3.05 Silt Fence

3.09 Temporary Diversion Dike

3.10 Temporary Fill Diversion

3.39 Dust Control

SECTION 1

Introduction

AGVIQ\CH2M HILL Joint Venture I (JV I) has been contracted by the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command to provide excavation and mechanical screening of Site 3 soils at St. Juliens Creek Annex (SJCA) located in Chesapeake, Virginia (Figures 1-1 and 1-2). A detailed description of the work activities for this task order are presented in the Work Plan (WP). The erosion and sediment controls for this work are presented in this Erosion and Sediment Control Plan (ESCP).

1.1 Site Background

The SJCA facility is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, located in southeastern Virginia. The facility covers approximately 490 acres (Figure 1-1).

The facility is bordered to the north by the Norfolk and Western Railroad, the City of Portsmouth, and residential areas; to the west by residential areas; to the south by St. Juliens Creek; and to the east by the Southern Branch of the Elizabeth River. Most of the surrounding areas are developed and include residences, schools, recreational areas, and shipping facilities for several large industries.

St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. In the past, operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. In addition, the Annex has been involved in specific ordnance operations and processes including those involving black powder operations, smokeless powder operations, projectile loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. All ordnance related activities at SJCA have been discontinued.

St. Juliens Creek Annex has also been involved in non-ordnance operations, including degreasing operations, paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash rack operations, potable and salt water fire protection systems, and fire training operations. Many of these operations have been discontinued, such as locomotive maintenance and printing.

Activity at SJCA has decreased in recent years. The current primary mission of SJCA is to provide a radar testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Shore Intermediate Maintenance Activity (SIMA), a radar testing facility, and a cryogenics school for tenant naval commands.

Materials stored at SJCA have included oil, ordnance materials, non-ordnance chemicals, and disaster preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

1.2 Objectives and Scope of Work

The objective of this interim removal action will be to:

- Excavate, screen, and dispose of Site 3 soils
- Back fill and restore disturbed areas

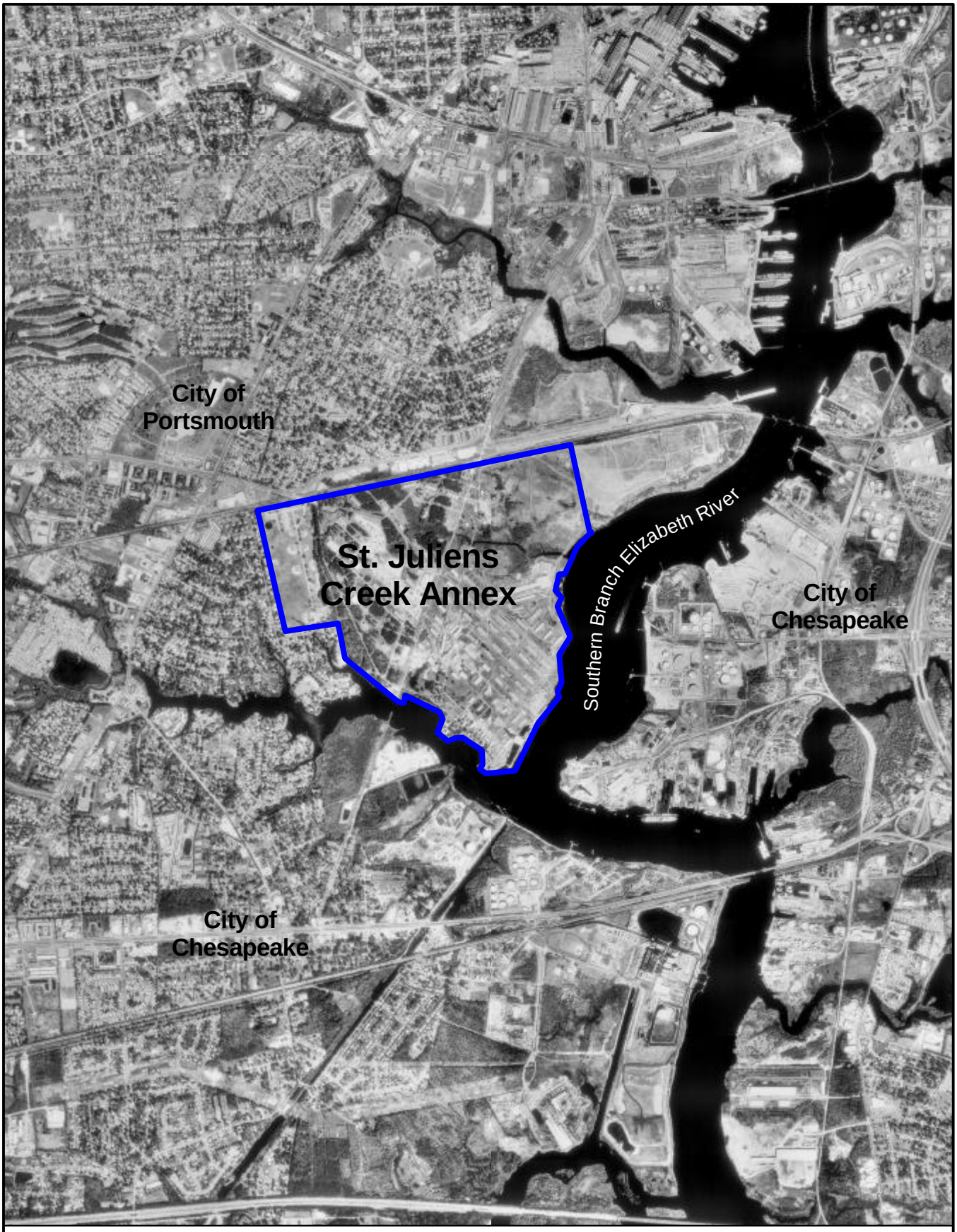
1.3 Project Schedule

The proposed project schedule is presented as Figure 3-1 in the Work Plan. The overall project will last 8 months with the major field activities occurring during a 3-month period.

1.4 Document Usage

This ESCP is to be used as a preliminary document to establish minimum requirements for the installation and maintenance of the various control structures for preventing erosion and soil loss.

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

St. Juliens Creek Annex

N

0 2000 4000 Feet

Figure 1-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

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

LEGEND

- Site Locations
- Roads
- Railroads
- Activity Boundary

N

500 0 500 1000 Feet

Figure 1-2
Location of Site 3
within St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

SECTION 2

Erosion and Sediment Controls

This section will discuss the site specific erosion and sediment (E&S) controls to be used at the Site. Since the scope of work requires only excavation and backfilling to pre excavation elevations, the E&S controls will be minimal.

2.1 Existing Drainage Features

The existing ground surface is relatively flat. The run off from the area is minimal and much of the storm water is infiltrated or received by the existing swales. There are existing drainage swales on site. The proposed scope of work does not include provisions for culverts, channels, or sediment traps/basins since the amount of run off into the excavation areas is minimal, and the excavations will contain their own surface water run off and will allow for natural infiltration.

2.2 Specific E&S Control Measures

As mentioned previously, E&S controls will be minimal based upon the work being performed and existing site conditions. Several areas will require E&S controls during work activities. These areas include the soil excavation area, screening area, soil stock piles, and the haul road. The E&S controls for these areas are discussed below:

2.2.1 Silt Fence

Silt fence will be installed around areas to be excavated and screened. The silt fence will be installed as part of the site preparation activities and will be established prior to excavation activities commencing. The installation of silt fence around the work areas will trap loose sediment on the down slope side (if required) and will divert run on for the up slope side of the excavation. Silt fence will not be installed along the boundaries of the work, which are adjacent to concrete or asphalt paved areas. Hay bales may be used in place of the silt fence in these areas to divert run on away from the excavation.

At the on-site soil stockpiles, silt fence will be installed at the down slope location of the work to trap sediment within the immediate work area.

2.2.2 Hay Bales

Hay bales will be used where the excavations are adjacent to existing concrete or asphalt areas. The hay bales will be used to divert storm water run off away from excavations.

The hay bales will be installed prior to excavation activities and will be maintained in accordance with the Virginia E&S Controls Handbook procedures.

2.2.3 Removal of Loose Soils

During the on-site transport of soil and backfill materials across Base haul roads, there is a slight potential that soil could fall from the hauling vehicles on to the haul road surfaces. If this situation is observed, a cleanup crew will immediately be deployed to remove the loose soils before it migrates. The cleanup crew will determine the source of fallen/dislodged soil (trucks, excavator, dozer) if not visually observed, and remove the soil accordingly.

2.3 Severe Weather

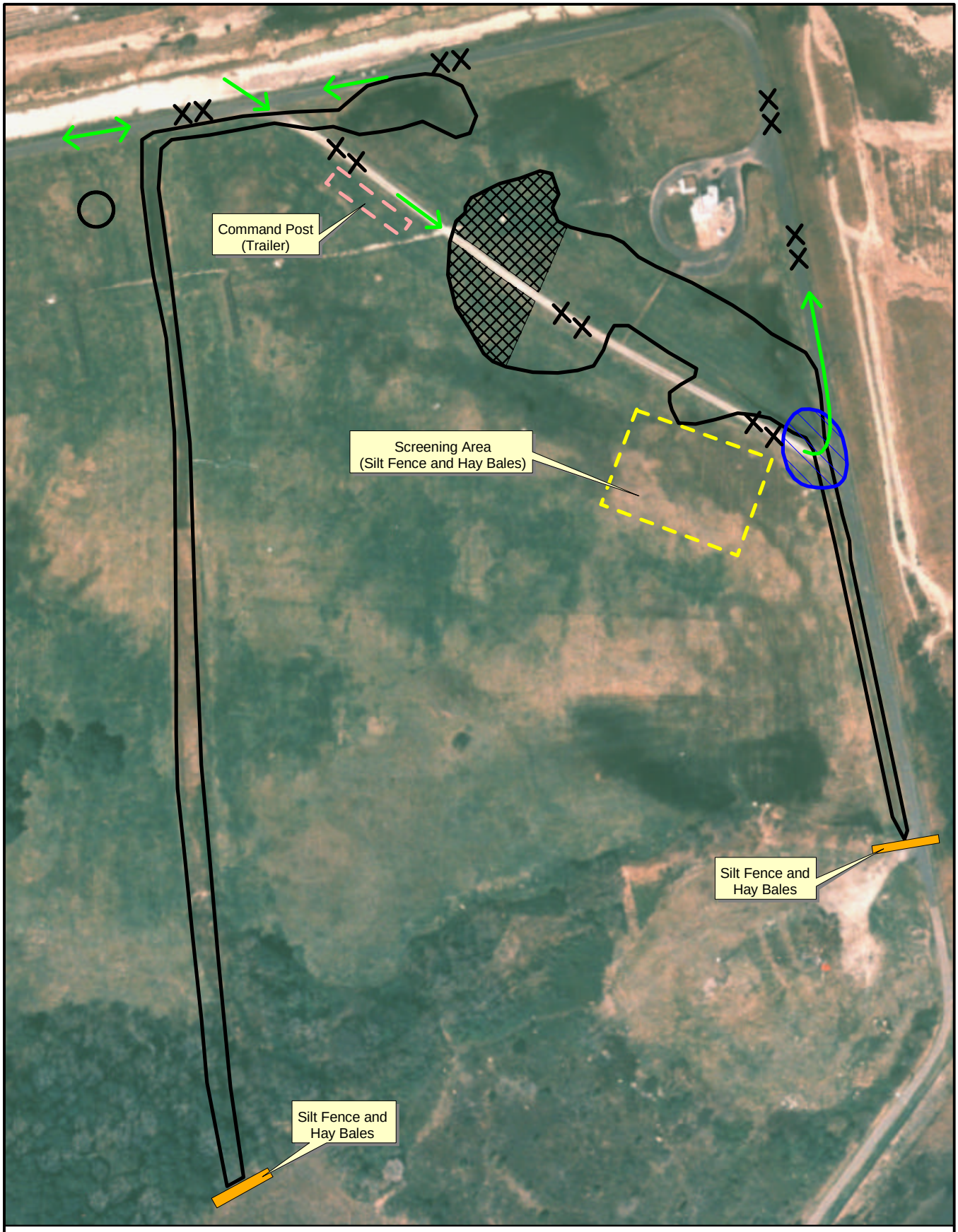
Short duration, high intensity rain showers may create unexpected erosion and drainage problems such as soil and containment erosion and ponding of water. Immediately after such events, all containment areas will be inspected for structural and practical integrity. Also, spillage or leakage will be immediately corrected. Repair to these devices will be made as soon as possible or at a minimum, prior to restarting any intrusive activities. Damage/repairs will be documented in the Superintendents' daily report. Excessive ponding of water will be allowed to naturally infiltrate.

The project management and operations personnel who are authorized and responsible for initiating response actions to minimize sever weather effects are listed below. Maintenance of the E&S site controls is a 24 hour responsibility.

- Project Superintendent-T.B.D.
- Project Manager-David Leadenham 757-318-9420

The project superintendent will be responsible for the maintenance of the E&S controls as well as site assessments after severe weather.

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

- Area Removed During 2002 Removal Action
- Site 3 Removal Action
- Command Post
- Screening Area
- Haul Road
- Truck Route
- Hay Bale / Silt Fence
- Crushed Stone Exit Ramp

N

0 100 200 Feet

Figure 2-1
Site 3 Work Zone
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

STD & SPEC 3.01
SAFETY FENCE

Definition

A protective barrier installed to prevent access to an erosion control measure.

Purpose

To prohibit the undesirable use of an erosion control measure by the public.

Conditions Where Practice Applies

Applicable to any control measure or series of measures which can be considered unsafe by virtue of potential for access by the public.

3.0 I-1
Physical Properties of Plastic Safety Fence

Physical Property	Test	Requirement
Recommended color	N/A	“International” orange
Tensile yield	ASTM D638	Average 2000 lbs. per 4 ft width
Ultimate tensile strength	ASTM D638	Average 2,900 lbs. per 4 ft width
Elongation at break (%)	ASTM D638	Greater than 1000%
Chemical resistance	N/A	Inert to most chemicals

Source: Conwed Plastics

Metal or “chain-link” fence should be used when a potentially dangerous control measure will remain in place permanently, such as a storm water detention or retention basin (see Plate 3.01-1). However, they may also be used for measures which will only serve a temporary function, at the discretion of those responsible for project safety. The metal fence must meet the following physical requirements:

a. Fabric shall be zinc-coated steel, 2-inch mesh, 9-gauge, minimum.

b. Coating shall have a minimum weight of 1.8 ounces per square foot.

c. Posts shall be steel pipe, zinc-coated.

d. Top nails shall be steel pipe, zinc-coated.

e. Braces shall be made of zinc-coated steel.

f. Gates shall be single or double swing, zinc-coated steel. They shall be a minimum of 12-feet wide.

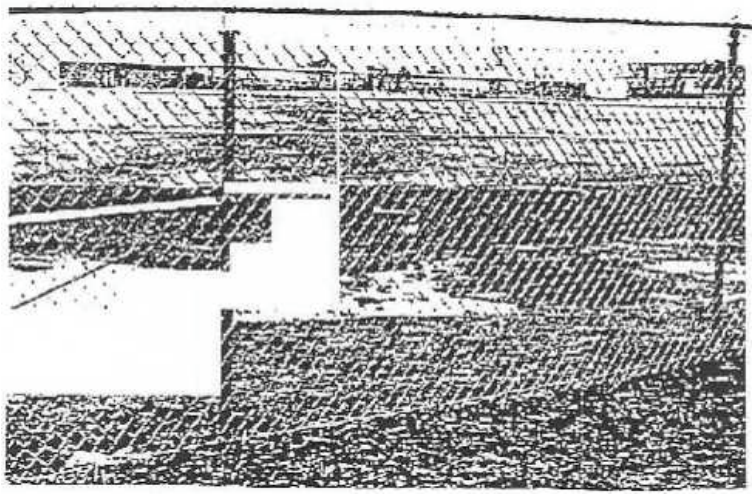
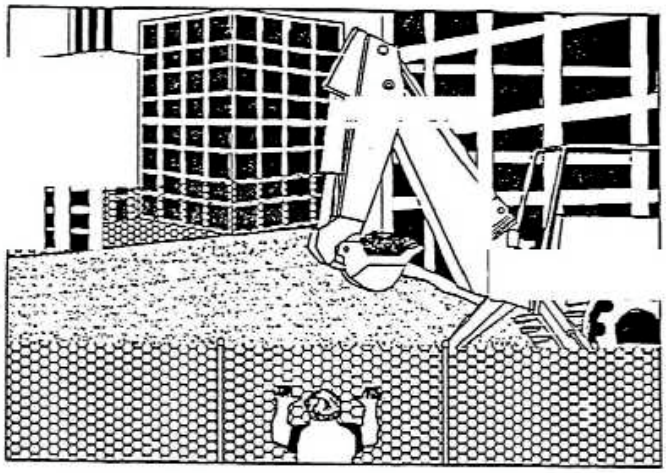


PLATE 3.01-1
Chain Link Fence



PERSPECTIVE VIEW

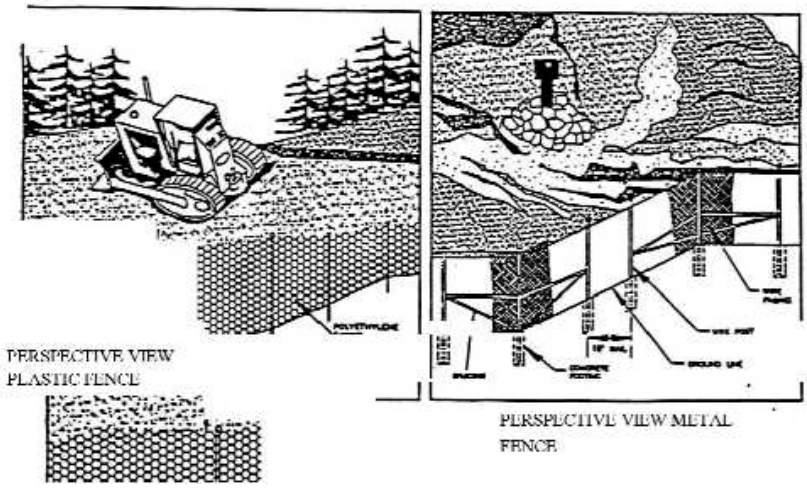


PLATE 3.01-2

Construction Specifications

1. Safety fences must be installed prior to the E&S measure becoming accessible.

2. The Polyethylene web of the plastic safety fence shall be secured to a conventional metal "T" or "U" post driven into the ground to a minimum depth of 18 inches; posts should be spaced at 6-foot centers. See "perspective" view in plate 3.01-1.

3. The metal safety fence shall be installed as per the following procedure:

    a. Line posts shall be placed at intervals of 10 feet measured from center to center of adjacent posts. In determining the post spacing, measurement will be made parallel with the ground surface. See "perspective" view in plate 3.01-1.

    b. Posts will be set in concrete and backfilled or anchored by other acceptable means.

    c. Posts set in the tops of concrete walls shall be grouted into preformed holes to a minimum depth of 12 inches.

    d. All corner posts, end posts, gate posts, and pull posts shall be embedded, braced, and trussed as shown in the "Standard Fence – Chain-Link" detail found in the latest version of the Virginia Department of Transportation (VDOT) *Road and Bridge Standards*.

    e. Fencing fabric shall not be stretched until at least 4 days after the posts are grouted into walls or 14 days after the posts are set into concrete.

    f. The fabric shall be stretched taut and securely fastened, by means of tie clips, to the posts at intervals not exceeding 15 inches and to the top rails or tension wires at intervals not exceeding 2 feet. Care shall be taken to equalize the tension on each side of each post.

4. Applicable warning signs noting hazardous conditions must be installed immediately upon installation of safety fences.

Maintenance

1. Safety fence shall be checked regularly for weather-related or other drainage. Any necessary repairs must be made immediately.

2. Care should be taken to secure all access points (gates) at the end of each working day. All locking devices must be repaired or replaced as necessary.

STD & SPEC 3.02
TEMPORARY STONE CONSTRUCTION ENTRANCE

Definition

A stabilized stone pad with a filter fabric underliner located at points of vehicular ingress and egress on a construction site.

Purpose

To reduce the amount of mud transported onto paved public roads by motor vehicles or runoff.

Conditions Where Practice Applies

Wherever traffic will be leaving a construction site and move directly onto a public road or other paved area.

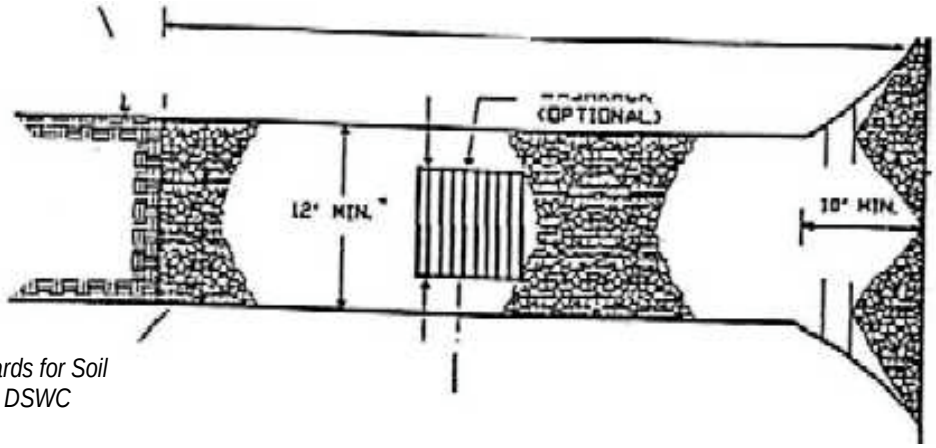


PLATE 3.02-1
Stone Construction Entrance
Source: Adapted from Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC

Planning Considerations

Minimum Standard #17 (MS #17) requires that provisions be made to minimize the transport of sediment by vehicular traffic onto a paved surface. Construction entrances provide an area where a significant amount of mud can be removed from construction vehicle tires before they enter a public road and, just as important, the soil adjacent to the paved surface can be kept intact. A filter fabric liner is used as a "separator" to minimize the dissipation of aggregate into the underlying soil due to construction traffic loads. If the action of the vehicles traveling over the gravel pad is not sufficient to remove the majority of the mud or there exists an especially sensitive traffic situation on the adjacent paved road, the tires must be washed before the vehicle enters the public road. If washing is necessary, provisions must be made to intercept the wash water and trap the sediment so it can be collected and stabilized. Construction entrances should be used in conjunction with the stabilization of construction roads (see Std. & Spec. 3.03, CONSTRUCTION ROAD STABILIZATION) to reduce the amount of mud picked up by construction vehicles and to improve mud removal. Other innovative techniques for accomplishing the same purpose can be used, but only after specific plans and details are submitted to and approved by the appropriate Plan-Approving Authority.

Design Criteria

Aggregate Size

VDOT #1 Coarse Aggregate (2- to 3-inch stone) should be used.

Entrance Dimension

The aggregate layer must be at least 6 inches thick; a minimum 3 inches of aggregate should be placed in a cut section to give the entrance added stability and to help secure filter cloth separator. It must extend the full width of the vehicular ingress and egress area and have a minimum 12-foot width. The length of the entrance must be at least 70 feet (see Plate 3.02-1).

Washing

If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone then the tires of the vehicles must be washed before entering the public road. Wash water must be carried away from the entrance to an approved settling area to remove sediment. All sediment shall be prevented from entering storm drains, ditches, or watercourses. A wash rack may also be used to make washing more convenient and effective (see Plate 3.02-1).

Location

The entrance should be located to provide for maximum use by all construction vehicles.

Construction Specifications

The area of the entrance must be excavated a minimum of 3 inches and must be cleared of all vegetation, roots, and other objectionable material. The filter fabric underliner will then be placed the full width and length of the entrance.

Following the installation of the filter cloth, the stone shall be placed to the specified dimensions. I wash racks are used, they should be installed according to manufacturer's specifications. Any drainage facilities required due to washing should be constructed

according to specifications. Conveyance of surface water under entrance, through culverts, shall be provided as required. If such conveyance is impossible, the construction of a "mountable" berm with 5:1 slopes will be permitted.

The filter cloth used shall be a woven or non-woven fabric consisting only of continuous chain Polymeric filaments or polyester. The fabric shall be inert to commonly encountered chemicals and hydrocarbons, be mildew and rot resistant, and conform to the physical properties noted in Table 3.02-A.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

TABLE 3.02-A
Construction Specifications for Filter Cloth Underliner

Fabric Properties[1]	Light-Duty Entrance [2] (Graded Subgrade)	Heavy-Duty Entrance[3] (Rough Graded)	Test Method
Grab Tensile Strength (lbs.)	200	220	ASTM D1682
Elongation at Failure (%)	50	220	ASTM D1682
Mullen Burst Strength (lbs.)	190	430	ASTM D3786
Puncture Strength(lbs.)	40	125	ASTM D751(modified)
Equivalent Opening Size (mm)	40-80	40-80	Sieve CW-02215

[1] Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

[2] Light Duty-Entrance: Sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Examples of fabrics which can be used are: Trevira Spunbound 1115, Mirafi 100X., Typar 3401, or equivalent.

[3] Heavy Duty Entrance: Sites with only rough grading and where most travel would be multi-axle vehicles. Examples of fabrics which can be used are: Trevira Spunbond 1135, Mirafi 600X, or equivalent.

Source: Virginia Highway and Transportation Research Council (VHTRC)

STD & SPEC 3.03
CONSTRUCTION ROAD STABILIZATION

Definition

The temporary stabilization of access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes with stone immediately after grading.

Purposes

1. To reduce the erosion of temporary roadbeds by construction traffic during wet weather.

2. To reduce the erosion and subsequent regrading of permanent roadbeds between the time of initial grading and final stabilization.

Conditions Where Practice Applies

Wherever stone-base roads or parking areas are constructed, whether permanent or temporary, for use by construction traffic.

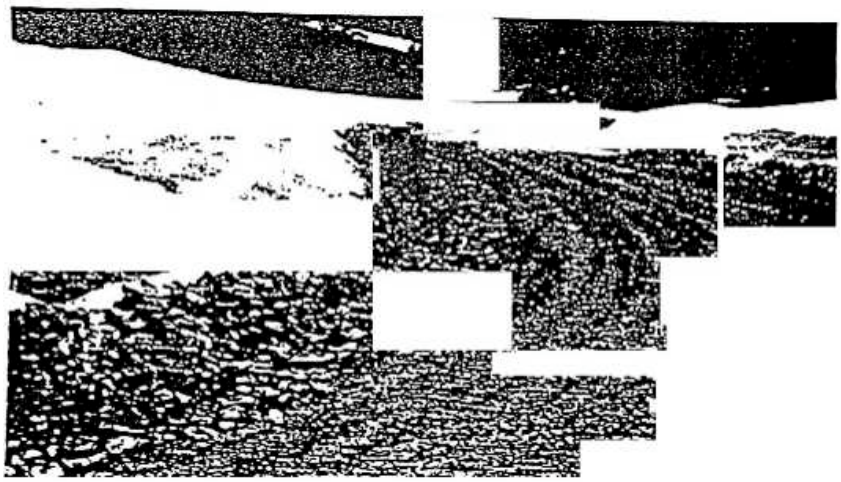


PLATE 3.03—1
Construction Road Stabilization

Planning Consideration

Areas which are graded for construction vehicle transport and parking purposes are especially susceptible to erosion. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires which generate significant quantities of sediment that may pollute nearby streams or be transported off site on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Immediate stabilization of such areas with stone may cost money at the outset, but it may actually save money in the long run by increasing the usefulness of the road during wet weather.

Permanent roads and parking areas should be paved as soon as possible after grading. However, it is understandable that weather conditions or the potential for damage may not make, the paving feasible in the early phases of the development project. As an alternative, early application of stone may solve potential erosion and stability problems and eliminate later regrading costs. Some of the stone will also probably remain in place for use as part of the final base course in the construction of the road.

Specifications

Temporary Access Roads and Parking Areas

1. Temporary roads shall follow the contour of the natural terrain to the extent possible. Slopes should not exceed 10 percent.
2. Temporary parking areas should be located on naturally flat areas to minimize the grading. Grades should be sufficient to provide drainage but should not exceed 4 percent.
3. Roadbeds shall be at least 14 feet wide for one-way traffic and 20 feet wide for two-way traffic.
4. All cuts and shall be 2:1 or flatter to the extent possible.
5. Drainage ditches shall be provided as needed and shall be designed and constructed in accordance with STORMWATER CONVEYANCE CHANNEL, Std. & Spec. 3.17.
6. The roadbed or parking surface shall be cleared of all vegetation, roots and other objectionable material.
7. A 6-inch course of VDOT #1 Coarse Aggregate shall be applied immediately after grading or the completion of utility installation within the right-of-way. Filter fabric may be applied to the roadbed for additional stability. Design specifications for filter fabric can be found within Std. & Spec. 3.02, TEMPORARY STONE CONSTRUCTION ENTRANCE. In “heavy duty” traffic situations (see Table 3.02 A), stone should be placed at an 8- to 10-inch depth to avoid excessive dissipation or maintenance needs.

Permanent Roads and Parking Areas

Permanent roads and parking areas shall be designed and constructed in accordance with applicable VDOT or local criteria except that an initial base course of gravel of at least 6 inches shall be applied immediately following grading.

Vegetation

All roadside ditches, cuts, fills, and disturbed areas adjacent to parking areas and roads shall be stabilized with appropriate temporary or permanent vegetation.

Maintenance

Both temporary and permanent roads and parking areas may require periodic top dressing with new gravel. Seeded areas adjacent to the roads and parking areas should be checked periodically to ensure that a vigorous stand of vegetation is maintained. Roadside ditches and other drainage structures should be checked regularly to ensure that they do not become clogged with silt or other debris.

STD & SPEC 3.04
STRAW BALE BARRIER

Definition

A temporary sediment barrier consisting of a row of entrenched and anchored straw bales.

Purpose

To decrease the velocity of sheet flows.

Conditions Where Practice Applies

1. Below disturbed areas subject to sheet and rill erosion.
2. Where the size of the drainage area is no greater than one-fourth of an acre per 100 feet of barrier length; the maximum slope length behind the barrier is 100 feet; and the maximum slope gradient behind the barrier is 50 percent (2:1).
3. Where effectiveness is required for less than 3 months.
4. Under no circumstances should straw bale barriers be constructed in live streams or in swales where there is the possibility of a washout.
5. The measure should not be used where water may concentrate in defined ditches and minor swales.
6. Straw bale barriers shall not be used on areas where rock or another hard surface prevents the full and uniform anchoring of the barrier.

Planning Considerations

Based on observations made in Virginia, Pennsylvania, Maryland and other parts of the nation, straw bale barriers have not been as effective as many users had hoped they would be, especially when used to slow down and filter concentrated flows. They should be used judiciously and with caution as erosion control measures. There are three major reasons for such ineffectiveness.

Firstly, improper utilization of straw bale barriers has been a major problem. Straw bale barriers have been used in streams and drainageways where high water depth and velocities have destroyed or damaged the control. Secondly, improper placement and installation of the barriers, such as staking the bales directly to the ground with no soil seal or entrenchment, has allowed undercutting and end flow. This has resulted in additions of, rather than removal of, sediment from runoff waters. Finally, inadequate maintenance lowers the effectiveness of these barriers. Trapping efficiencies of carefully installed straw bale barriers on one project in Virginia dropped from 57 percent to 16 percent in 1 month due to lack of maintenance.

There are serious questions about the continued use of straw bale barriers as they are presently installed and maintained. Averaging from $3 to $6 per linear foot, the thousands of straw bale barriers used annually in Virginia represent such a considerable expense that optimum installation procedures should be emphasized.

Design Criteria

A formal design is not required. However, an effort should be made to locate the straw bale barrier, as well as other perimeter controls, at least 5 to 7 feet from the base of disturbed slopes with grades greater than 7 percent. This will help prevent the measure from being rendered useless following the initial movement of soil.

Construction Specifications

Sheet Flow Application

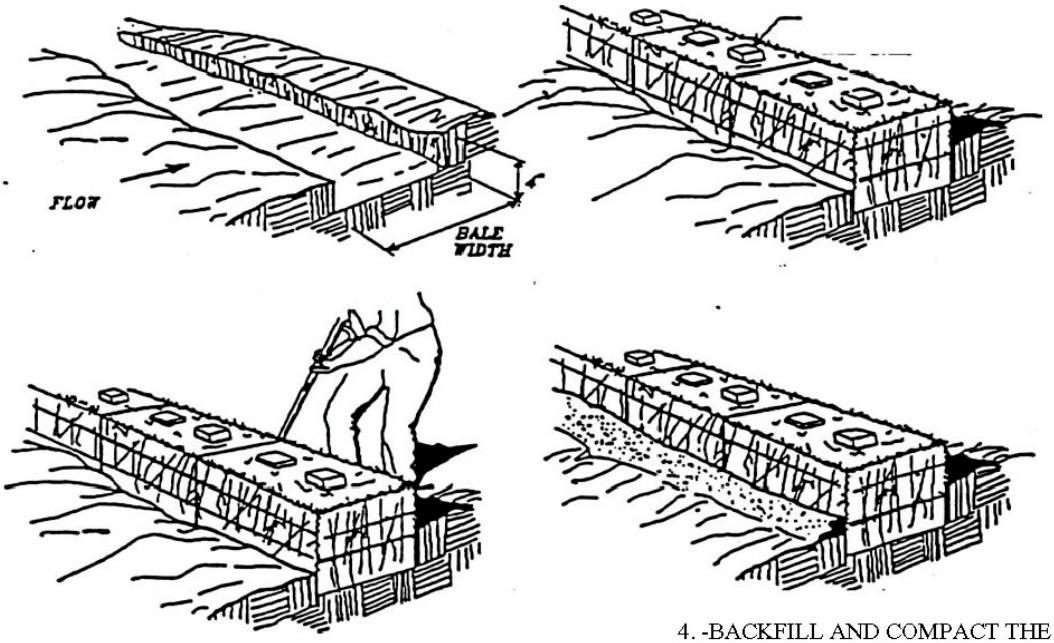
1. Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.
2. All bales shall be either wire-bound or string-tied. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings (see Plate 3.04-1).
3. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier (see Plate 3.04-1).

PROPERLY INSTALLED STRAW' BALE

(CROSS SECTION)

1. EXCAVATE THE TRENCH.

2. PLACE AND STAKE STRAW SALES.



3. WEDGE LOOSE STRAW BETWEEN BALES.

4. -BACKFILL AND COMPACT THE EXCAVATED SOIL

PLATE 3.04-1
Construction of a Straw Bale Barrier

4. Each bale shall be securely anchored by at least two stakes (minimum dimensions 2 inches x 2 inches x 36 inches) or standard or "U" steel posts driven through the bale. The first stake or steel post at each bale shall be driven toward the previously laid bale to force the bales together. Stakes or steel pickets shall be driven a minimum 18 inches deep into the ground to securely anchor the bales.
5. The gaps between bales shall be chinked with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency.
6. Inspection shall be frequent and repair or replacement shall be made promptly as needed.
7. Straw bale barriers shall be removed when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

Maintenance

1. Straw bale barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
2. Close attention shall be paid to the repair of damaged bales, end runs, and undercutting beneath bales.
3. Necessary repairs to barriers or replacement of bales shall be accomplished promptly.
4. Sediment deposits should be removed after each rainfall. They must be removed when the level of deposition reaches approximately one-half the height of the barrier.
5. Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.

STD & SPEC 3.05
SILT FENCE

Definition

A temporary sediment barrier consisting of a synthetic filter fabric stretched across and attached to supporting posts and entrenched.

Purposes

1. To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.
2. To decrease the velocity of sheet flows and low-to-moderate level channel flows.

Conditions Where Practice Applies

1. Below disturbed areas where erosion would occur in the form of sheet and rill erosion.
2. Where the size of the drainage area is no more than one quarter acre per 100 feet of silt fence length; the maximum slope length behind the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1).
3. In minor swales or ditch lines where the maximum contributing drainage area is no greater than 1 acre and flow is no greater than 1 cfs.
4. Silt fence will not be used in areas where rock or some other hard surface prevents the full and uniform depth anchoring of the barrier.

Planning Considerations

Laboratory work at the Virginia Highway and Transportation Research Council (VHTRC) has shown that silt fences can trap a much higher percentage of suspended sediments than straw bales, though silt fence passes the sediment-laden water slower. Silt fences are preferable to straw barriers in many cases because of their durability and potential cost savings. While the failure rate of silt fences is lower than that of straw barriers, many instances have been observed where silt fences are improperly installed, inviting failure and sediment loss. The installation methods outlined here can improve performance and reduce failures.

As noted, flow rate through silt fence is significantly lower than the flow rate for straw bale barriers. This creates more ponding and hence more time for sediment to fall out. Table 3.05-A demonstrates these relationships.

Both woven and non-woven synthetic fabrics are commercially available. The woven fabrics generally display higher strength than the non-woven fabrics and, in most cases, do not require any additional reinforcement. When tested under acid and alkaline water conditions, most of the woven fabrics increase in strength, while the reactions of non-woven fabrics to these conditions are variable. The same is true of testing under extensive ultraviolet radiation. Permeability rates vary regardless of fabric type. While all of the fabrics demonstrate very high filtering efficiencies for sandy sediments, there is considerable variation among both woven and non-woven fabrics when filtering the finer silt and clay particles.

Design Criteria

1. No formal design is required. As with straw bale barriers, an effort should be made to locate silt fence at least 5 feet to 7 feet beyond the base of disturbed slopes with grades greater than 7 percent.

2. The use of silt fences, because they have such a low permeability, is limited to situations in which only sheet or overland flows are expected and where concentrated flows originate from drainage areas of I acre or less.

3. Field experience has demonstrated that, in many instances, silt fence is installed too short (less than 16 inches above ground elevation). The short fence is subject to breaching during even small storm events and will require maintenance "clean outs" more often. Properly supported silt fence which stands 24 to 34 inches above the existing grade tends to promote more effective sediment control.

Installation

The height of a silt fence shall be a minimum of 16 inches above the original ground surface and shall not exceed 34 inches above ground elevation.

Construction Specifications

1. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the requirements noted in Table 3.05-B.

2. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0°F to 120°F.

3. If wooden stakes are utilized for silt fence construction, they must have a diameter of 2 inches when oak is used and 4 inches when pine is used. Wooden stakes must have a minimum length of 5 feet.

4. The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter cloth shall be spliced together only at a support post with a minimum 6-inch overlap, and securely sealed.

5. A trench shall be excavated approximately 4-inches wide and 4-inches deep on the upslope side of the proposed location of the measure.

6. When wire support is used, standard-strength filter cloth may be used. Posts for this type of installation shall be placed a maximum of 10 feet apart (see Plate 3.05-1). The wire mesh fence must be fastened securely to the upslope side of the posts using heavy duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 34 inches above the original ground surface. The standard-strength fabric shall be stapled or wired to the wire fence, and 8 inches of the fabric shall be extended into the trench. The fabric shall not be stapled to existing trees.

7. When wire support is not used, extra-strength filter cloth shall be used. Posts for this type of fabric shall be placed a maximum of 6-feet apart (see Plate 3.05-2). The filter

fabric shall be fastened securely to the upslope side of the posts using 1-inch long (minimum) heavy-duty wire staples or tie wires and 8 inches of the fabric shall be extended into the trench. The fabric shall not be stapled to existing trees. This method of installation has been found to be more commonplace than #4.

6. If a silt fence is to be constructed across a ditch line or swale, the measure must be of sufficient length to eliminate endflow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope (see Plate 3.05-2). Extra-strength filter fabric shall be used for this application with a maximum 3-foot spacing of posts. All other installation requirements noted in #5 apply.

7. The 4-inch by 4-inch trench shall be backfilled and the soil compacted over the filter fabric.

8. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

1. If steel posts (standard "U" or section) are utilized for silt fence construction, they must have a minimum weight of 1.33 pounds per linear foot and shall have a minimum length of 5 feet.

2. Wire fence reinforcement for silt fences using standard-strength filter cloth shall be a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches.

Maintenance

1 Silt fences shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.

2. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting.

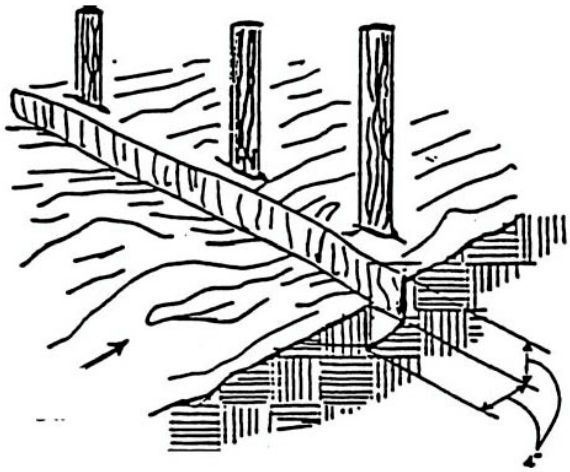
3. Should the fabric on a silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.

4. Sediment deposits should be removed after each storm. They must be removed when deposits reach approximately one-half the height of the barrier.

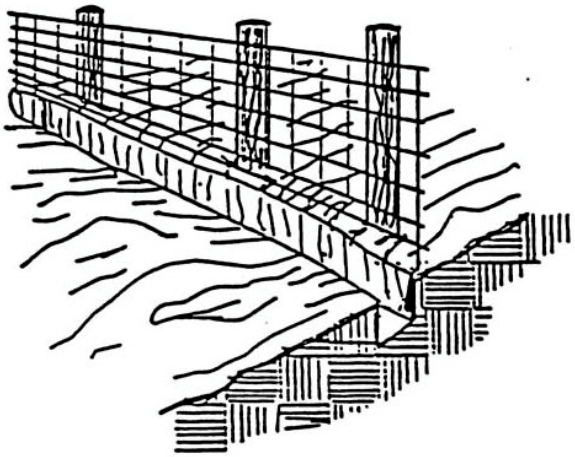
5. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

CONSTRUCTION OF A SILT FENCE (WITH W1RE SUPPORT)

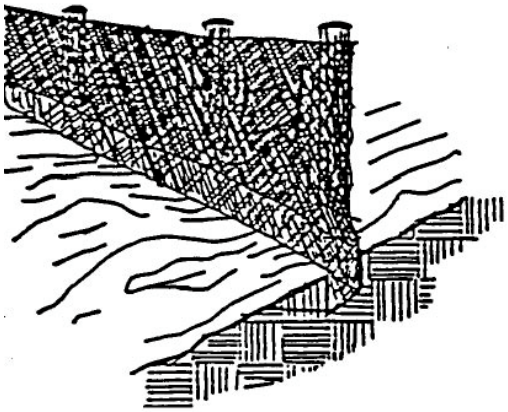
I - SET POSTS ANO EXCAVATE A -4X4 TRENCH UPSLOPE ALONG THE LINE OF POSTS.



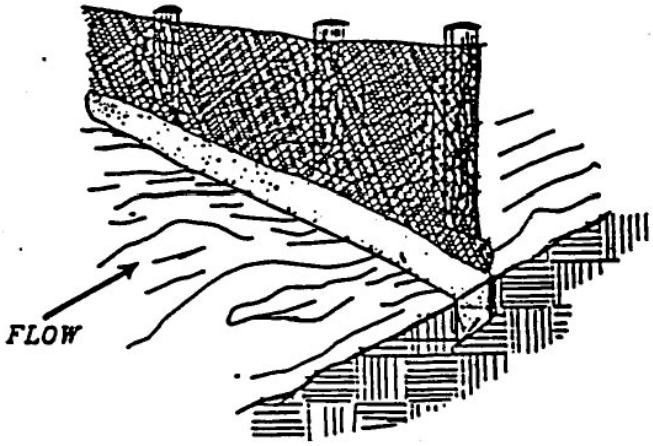
2. STAPLE WIRE FENCINC TO THE POSTS



3- *ATTACH THE FILTER* FABRIC To THE WIRE



4. BACKFILL AND COMPACT THE EXCAVATED SOIL



EXTENSION OF FABRIC ANO WIRE INTO THE TRENCH

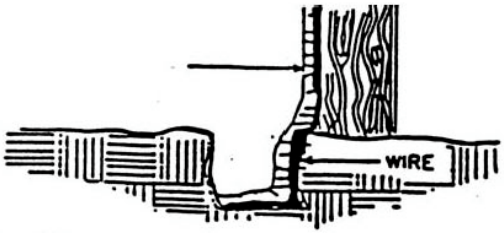
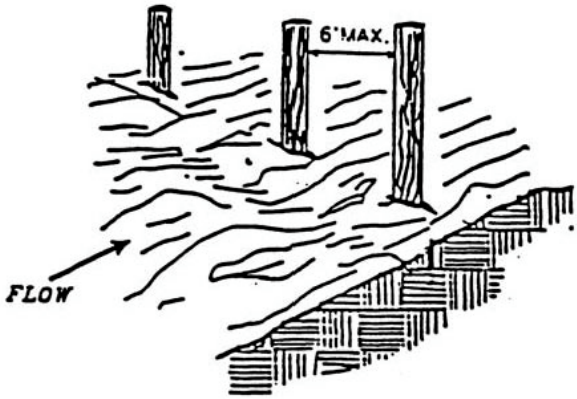
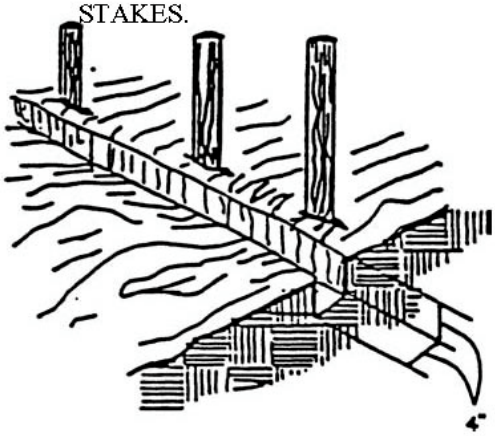


PLATE 3.05—1
Construction of a Silt Fence

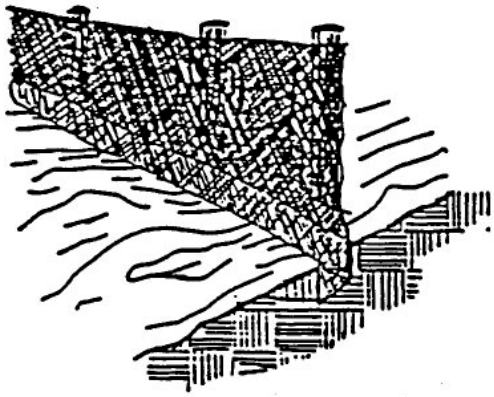
I - SET THE STAKES.



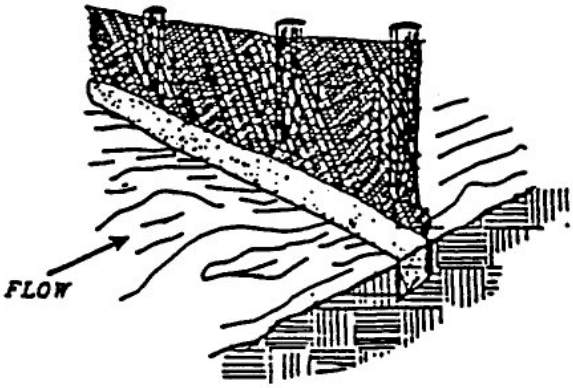
2. EXCAVATE A 4"X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



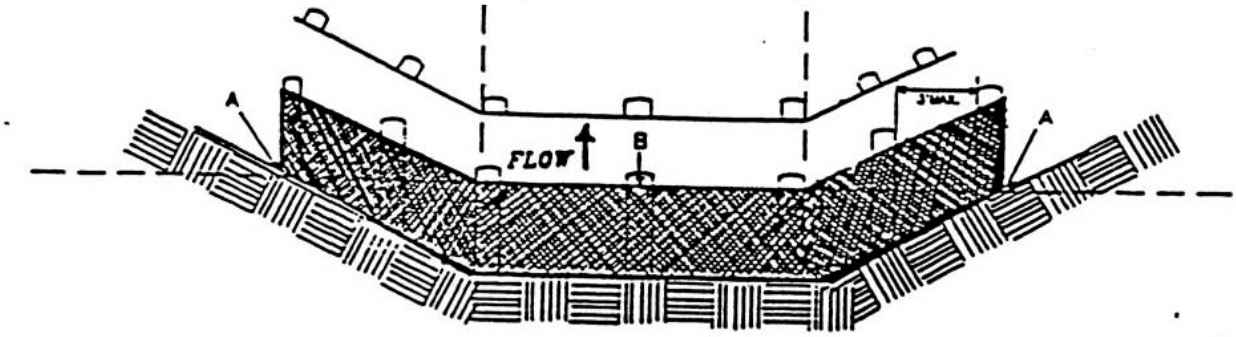
3. STAPLE FILTER TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL



SHEET F - LOW INSTALLATION
(PERSPECTIVE VIEW)



POINT'-C A SHOULD BE HIGHER THAN POINT B.

PLATE 3.05—2
Construction of a Silt Fence
Source: Adapted from Installation Straw and Fabric Filter Barriers for Sediment Control. Sherwood and Wyant

TABLE 3.05-A
Typical Flow Rates and Filtering Efficiencies of Perimeter Control

Material	Flow Rate (gal. sq. ft./min.)	Filter Efficiency (%)
Straw	5.6	67
Synthetic Fabric	03	97

Source: VHTRC

TABLE 3.05-B
Physical Properties of Filter Fabric in Silt Fence

Physical Properties	Test Method	Requirements
Filtering Efficiency	ASTM D5141	75% (minimum)
Tensile Strength at 20% (max.) Elongation	VTM-52	Extra Strength – 50 lbs. linear inch (minimum)
		Standard Strength – 30 lbs. linear inch (minimum)
Flow Rate	ASTM D5141	02 gal./sq ft. minute (minimum)
Ultraviolet Radiation Stability %	ASTM-G-26	90% (minimum)

Requirements reduced by 50% after 6 months of installation.

Source: VHTRC

STD & SPEC 3.09
TEMPORARY DIVERSION DIKE

Definition

A temporary ridge of compacted soil constructed at the top or base of a sloping disturbed area.

Purposes

1. To divert storm runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabilized outlet.
2. To divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin.

Conditions Where Practice Applies

Wherever stormwater runoff must be temporarily diverted to protect disturbed areas and slopes or retain sediment on site during construction. These structures generally have a life expectancy of 18 months or less, which can be prolonged with proper maintenance.

Planning Considerations

A temporary diversion dike is intended to divert overland sheet flow to a stabilized outlet or a sediment-trapping facility during establishment of permanent stabilization on sloping disturbed areas. When used at the top of a slope, the structure protects exposed slopes by keeping upland runoff away. When used at the base of a slope, the structure protects adjacent and downstream areas by diverting sediment-laden runoff to a sediment trapping facility.

As per M.S. #5, it is very important that a temporary diversion dike be stabilized immediately following installation with temporary or permanent vegetation to prevent erosion of the dike itself. The gradient of the channel behind the dike is also an important consideration. The dike must have a positive grade to assure drainage, but if the gradient is too great, precautions must be taken to prevent erosion due to high-velocity channel flow behind the dike. The cross-section of the channel which runs behind the dike should be of a parabolic or trapezoidal shape to help inhibit a high velocity of flow which could arise in a vee ditch.

This practice is considered an economical one because it uses material available on the site and can usually be constructed with equipment needed for site grading. The useful life of the practice can be extended by stabilizing the dike with vegetation. Diversion dikes are preferable to silt fences because they are more durable, less expensive, and require much less maintenance when constructed properly. Along with a TEMPORARY SEDIMENT TRAP (Std. & Spec. 3.13), they become a logical choice for a control measure once the control limits of the silt fence or straw bale barrier have been exceeded.

Temporary diversion dikes are often used as a perimeter control in association with a sediment trap or a sediment basin, or a series of sediment-trapping facilities, on moderate to large construction sites. If installed properly and in the first phase of grading, maintenance costs are very low. Often, cleaning of sediment-trapping facilities is the only associated maintenance requirement.

As specified herein, this practice is intended to be temporary. However, with more stringent design criteria, it can be made permanent in accordance with DIVERSIONS (Std. & Spec. 3.12).

Design Criteria

No formal design is required. The following criteria shall be met:

Drainage Area

The maximum allowable drainage area is 5 acres.

Height

The minimum allowable height measured from the upslope side of the dike is 18 inches (see Plate 3.09-1).

Side Slopes

1½:1 or flatter, along with a minimum base-width of 4.5 feet (see Plate 3.09-1).

Grade

The Channel behind the dike shall have a positive grade to a stabilized outlet. If the channel slope is less than or equal to 2 percent, no stabilization is required. If the slope is greater than 2 percent, the channel shall be stabilized in accordance with Std. & Spec. 3.17, STORMWATER CONVEYANCE CHANNEL.

Outlet

1. The diverted runoff, if free of sediment, must be released through a stabilized outlet or channel.
2. Sediment-laden runoff must be diverted and released through a sediment trapping facility such as a TEMPORARY SEDIMENT TRAP (Std. & Spec. 3.13) or TEMPORARY SEDIMENT BASIN (Std. & Spec. 3.14).

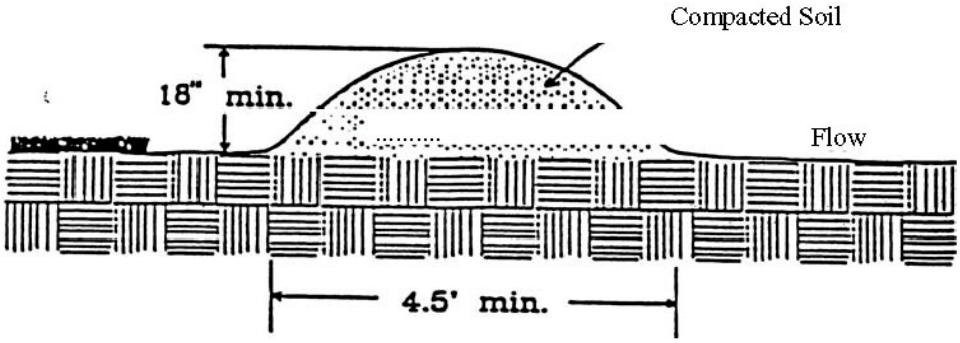


PLATE 3.09—1
Temporary Diversion Dike

Construction Specifications

1. Temporary diversion dikes must be installed as a first step in the land-disturbing activity and must be functional prior to upslope land disturbance.
2. The dike should be adequately compacted to prevent failure.
3. Temporary or permanent seeding and mulch shall be applied to the dike immediately following its construction.
4. The dike should be located to minimize damage by construction operations and traffic.

Maintenance

The measure shall be inspected after every storm and repairs made to the dike, flow channel outlet, or sediment trapping facility, as necessary. Once every 2 weeks, whether a storm has occurred or not, the measure shall be inspected and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.

STD & SPEC 3.10
TEMPORARY FILL DIVERSION

Definition

A channel with a supporting ridge of soil on the lower side, constructed along the lower side, constructed along the top of an active earth fill.

Purpose

To divert storm runoff away from the unprotected slope of the fill to a stabilized outlet or sediment-trapping facility.

Conditions Where Practice Applies

Where the drainage area at the top of an active earth fill slopes toward the exposed slope and where continuous fill operations make the use of a DIVERSION (Std. & Spec. 3.12) unfeasible. This temporary structure should remain in place for less than one week.

Planning Considerations

One important principle of erosion and sediment control is to keep stormwater runoff away from exposed slopes. This is often accomplished by installing a dike diversion such as a temporary slope drain or paved ditch at the top of a slope to carry the runoff away from the slope to a stabilized outlet. In general, these measures are installed after the final grade has been reached. On cuts, the measures may be installed at the beginning since the work proceeds from the top to the bottom of the slope, and the measures have little chance of being covered or damaged. On fills, the work proceeds from the bottom to the top and the elevation changes daily. It is therefore not feasible to construct a compacted dike or permanent diversion which may be covered by the next day's activity.

The temporary fill diversion is intended to provide some slope protection on a daily basis until final elevations are reached and a more permanent measure can be constructed. This practice can be constructed by the use of a motor grader or a small dozer. To shape the diversion, the piece of machinery used may run near the top edge of the fill with its blade tilted to form the channel as depicted in Plate 3.10-1. This work would be done at the end of the working day and provide a channel with a berm to protect the slope. Wherever possible, the temporary diversion should be sloped to direct water to a stabilized outlet. If the runoff is diverted over the fill itself, the practice may cause erosion by concentration water at a single point.

Good timing is essential to fill construction. The filling operation should be completed as quickly as possible and the permanent slope protection measures and slope stabilization measures installed as soon after completion as possible. With prompt and proper construction, the landowner or contractor will save both time and money in building, repairing and stabilizing the fill area. The longer the time period for construction and stabilization extends, the more prone the fill operation is to be damaged by erosion. Repairing the damages adds additional time and expense to the project.

Design Criteria

No formal design is required. The following criteria shall be met:

Drainage Area

The maximum allowable drainage area is 5 acres.

Height

The minimum height of the supporting ridge shall be 9 inches.

Grade

The channel shall have a positive grade to a stabilized outlet.

Outlet

The diverted runoff should be released through a stabilized outlet, slope drain or sediment trapping measure.

Permanent Methods

1. Permanent Vegetation - The application of PERMANENT SIDING (see Std. & Spec. 3.32) and saving existing trees and large shrubs can help reduce soil and air movement from construction sites.

3. Stone - Crushed stone or coarse gravel can be used as a permanent cover which will provide control of soil emissions.

Construction Specifications

1 The diversion shall be constructed at the top of the fill at the end of each work day as needed.

2. The diversion shall be located at least 2 feet inside the top edge of the fill.

3. The supporting ridge shall be constructed with a uniform height along its entire length. Without uniform height, the fill diversion may be susceptible to breaching.

Maintenance

Since the practice is temporary and under most situations will be covered the next work day; the maintenance required should be low. If the practice is to remain in use for more than one day, an inspection will be made at the end of each work day and repairs made to the measure if needed. The contractor should avoid the placement of any material over the structure while it is in use. Construction traffic should not be permitted to cross the diversion.

STD & SPEC 3.39
DUST CONTROL

Definition

Reducing surface and air movement of dust during land disturbing, demolition and construction activities.

Purpose

To prevent surface and air movement of dust from exposed soil presence of airborne substances which may present health hazards, traffic safety problems, or harm animal or plant life.

Conditions Where Practice Applies

In areas subject to surface and air movement of dust where on-site and off-site damage is likely to occur if preventive measures are not taken.

Planning Considerations

Construction activities inevitably result in the exposure and disturbance of soil. Fugitive dust is emitted both during the activities (i.e., excavation, demolition, vehicle traffic, human activity and as a result of wind erosion over the exposed earth surfaces). Large quantities of dust are typically generated in "heavy" construction activities, such as road and street, construction and subdivision, commercial or industrial development, which involve disturbance of significant areas of the soil surface. Research on construction sites has established an average dust emission rate of 1.2 tons/acre/month for active construction. Earth-moving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions.

In planning for dust control, limiting the amount of soil disturbance at any one time should be a key objective. Therefore, phased clearing and grading operations and the utilization of temporary stabilization in accordance with MS #1 can significantly reduce dust emissions. Undisturbed vegetative buffers (minimum 50-foot widths) left between graded areas and protected areas can also be very helpful in dust control.

Temporary Measures Used During Construction

1. Vegetative-Cover - In areas subject to little or no construction traffic, a vegetatively stabilized surface will reduce dust emissions (see TEMPORARY SEEDING, Std. & Spec. 3.31)

2. Mulch - When properly applied, mulch offers a fast, effective means of controlling dust. Not recommended for areas within heavy traffic pathways. Binders or tackifiers should be used to tack organic mulches (see MULCHING, Std. & Spec. 3-35).

3. Tillage - This practice is designed to roughen and bring clods to the surface. It is an emergency measure which should be used before wind erosion starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.

4. Irrigation - This is the most commonly used dust control practice. Site is sprinkled with water until the surface is wet. Repeat as needed. It offers fast protection for haul roads and other heavy traffic routes.

5. Spray-On Adhesives - Tremendous progress has been made in recent years in the development of products of this type. Most are effective on "mineral" soils and are ineffective on "muck" soils. These coherics are derived from a variety of compounds, both organic and synthetic based. Many of the adhesives will withstand heavy traffic loads. The organics include derivatives from pine tar and vegetable gum; synthetics may be acrylic or petroleum based.

The following table lists various adhesives and provides corresponding information on mixing and application:

TABLE 3.39-A
Adhesives Used for Dust Control

Adhesive	Water Dilution Adhesive; Water	Type of Nozzle	Application Rate Gallons/Acre
Anionic	7:1	Coarse Spray	1,200
Utex Emulsion	12.5:1	Fine Spray	235
Resin in Water	4:1	Fine Spray	300
Acrylic Emulsion (Non-Traffic)	7:1	Coarse Spray	450
Acrylic Emulsion (Traffic)	3.5:1	Coarse Spray	350

Source: VDSWC

6. Stone - Stone can be used to stabilize roads or other areas (see CONSTRUCTION ROAD STABILIZATION, Std. & Spec. 3.3).

7. Barriers - A board fence, wind fence sediment fence, or similar barrier can help to control air currents and blowing soil. Place barriers perpendicular to prevailing air currents at intervals of about 15 times the barrier height. Where dust is a known problem, existing windbreak vegetation should be preserved.

8. Calcium Chloride - This chemical may be applied by mechanical spreader as loose dry, granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage. Application rates should be strictly in accordance with suppliers' specified rates.

Appendix D
Environmental Protection Plan

Environmental Protection Plan
Interim Remedial Action (Phase II)
at Site 3
St. Juliens Creek Annex
Chesapeake, Virginia

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No. N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Virginia Beach, Virginia

Contents

1 Introduction 1-1
1.1 Plan Contents 1-1
1.2 Purpose 1-1
1.3 Facility Location and Background 1-7
1.4 Objectives and Scope of Work 1-7
1.5 Project Organization 1-7

2 Site-specific Information and Procedures 2-1
2.1 On-site Materials 2-1
2.2 Emergency Equipment 2-1
2.3 Site Evacuation Signal and Routes 2-2
2.4 Severe Weather 2-2
2.5 Dust Control and Erosion Protection 2-2

Tables

1-1 Emergency Information 1-8

Figures

1-1 Base Location Map 1-3

1-2 Site Location Map 1-5

1-3 Emergency Coordinator Organization Chart 1-9

SECTION 1

Introduction

AGVIQ-CH2M Hill Joint Venture I (JV I) has been contracted by the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command to provide excavation and mechanical screening of Site 3 soils at St. Juliens Creek Annex (SJCA) located in Chesapeake, Virginia (Figures 1-1 and 1-2). A detailed description of the work activities for this task order are presented in the Work Plan (WP). This site specific Environmental Protection Plan (EPP) has been prepared as a guidance document. Therefore, this site specific EPP will only provide information relevant for this project.

1.1 Plan Contents

This site specific EPP will only contain project specific information. This information will include the following:

- Purpose
- Facility location and back ground
- Project organization
- Materials inventory and compatibility
- Emergency equipment
- Site evacuation plan
- Dust control and erosion protection
- Potential spill sources and prevention practices

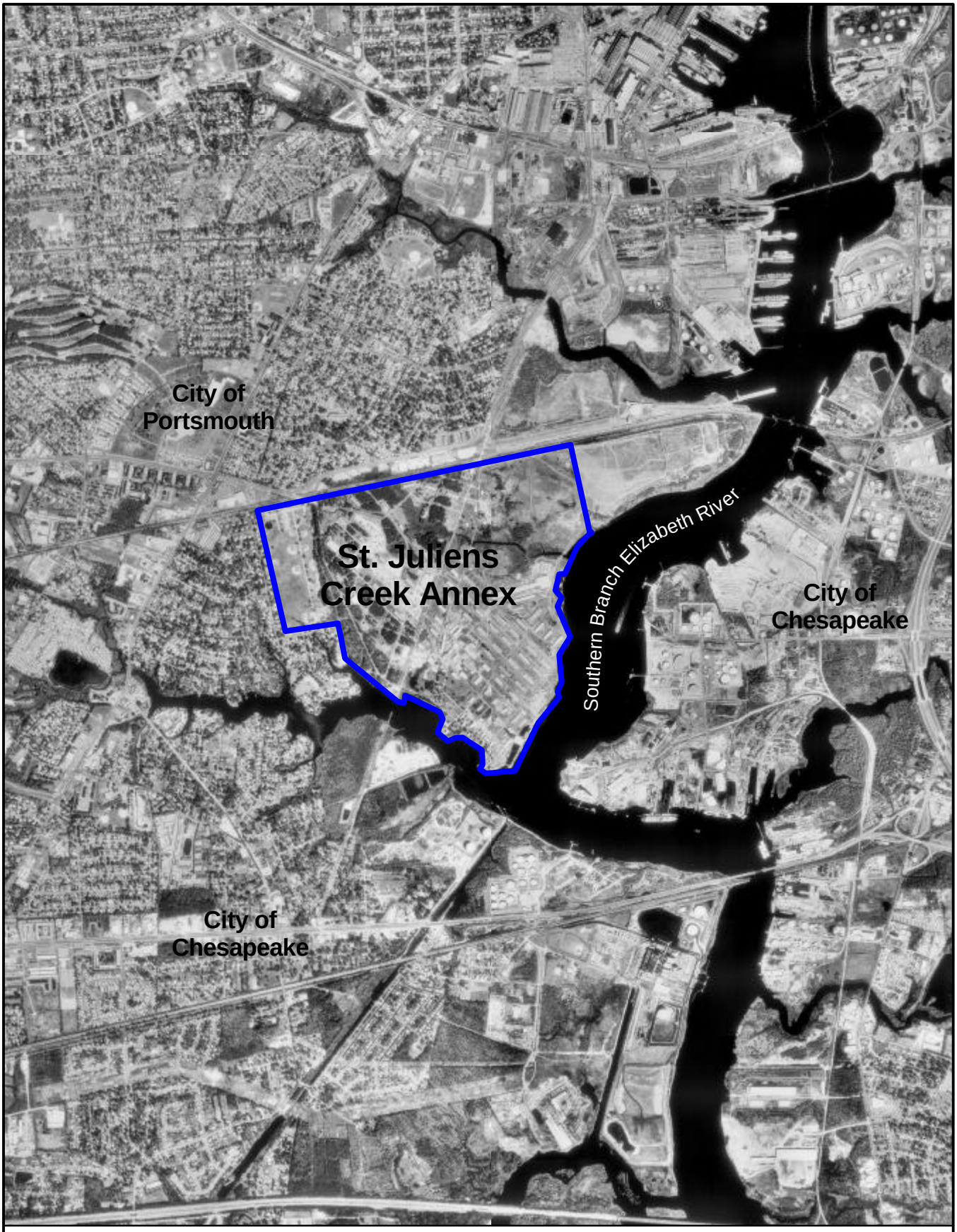
1.2 Purpose

The purpose of this EPP is to present information required to minimize the hazards to human health and the environment from fires, explosions, spills, releases of organic vapors, or any unplanned or sudden release of constituents of concern. JV I's organizational chart is provided in Figure 1-3.

This plan fulfills the requirements of the basic contract and task order 005 and in accordance with:

- Code of federal regulations (CFR) 29 1910-subpart G: Occupational health and Environmental Control
- 40 CFR 261: Identification and listing of hazardous waste
- 40 CFR 262: generators of hazardous Waste
- 40 CFR 263: Transporters of hazardous Waste
- 40 CFR 264: owners and Operators of hazardous Waste Treatment, storage, and disposal facilities
- 49 CFR 178: Shipping Container Specification
- COE EP-1165-2-304: 1976 Flood plain management
- VSWCC: 1992 Virginia erosion and Sediment Control Handbook

File Path: v:\18gis\st-juliens\figures\agviq.apr



LEGEND

St. Juliens Creek Annex

N

0 2000 4000 Feet

Figure 1-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

Back of Figure 1-1

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

LEGEND

- Site Locations
- Roads
- Railroads
- Activity Boundary

N

500 0 500 1000 Feet

Figure 1-2
Location of Site 3
within St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

AGVIQ CH2M HILL

Back of Figure 1-2

The plan establishes guidelines which will be followed during site activities and used in conjunction with other plans and documents.

1.3 Facility Location and Background

SJCA is a 490-acre parcel of land, owned by the Navy, and is located in the City of Chesapeake, Virginia. It is situated at the intersect of St. Juliens Creek and the Southern Branch of the Elizabeth River. St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. In the past, operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. In addition, the Annex has been involved in specific ordnance operations in processes including those involving black powder operations, smokeless powder operations, projectile loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. All ordnance related activities at SJCA have been discontinued.

St. Juliens Creek Annex has also been involved in non-ordnance operations, including degreasing operations, paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash rack operations, potable and salt water fire protection systems, and fire training operations. Many of these operations have been discontinued, such as locomotive maintenance and printing.

Activity at SJCA has decreased in recent years. The current primary mission of SJCA is to provide a radar testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Shore Intermediate Maintenance Activity (SIMA), a radar testing facility, and a cryogenics school for tenant naval commands.

Materials stored at SJCA have included oil, ordnance materials, non-ordnance chemicals, and disaster preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

1.4 Objectives and Scope of Work

The objective of this interim removal action will be to:

- Excavate, screen, and dispose of Site 3 soils, waste and sediment
- Back fill and restore disturbed areas

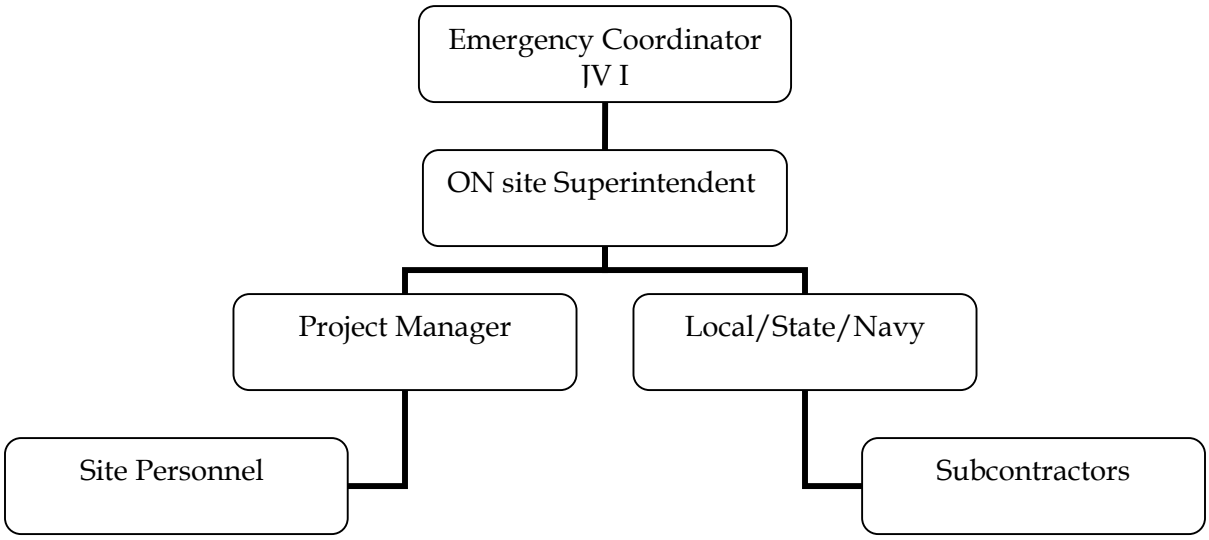
1.5 Project Organization

JV I is responsible for implementing the environmental protection procedures contained in this EPP. Part of the protection procedures will involve notification to local and state agencies. A list of emergency agencies and their telephone numbers is presented in Table 1-1.

TABLE 1-1
Emergency Information

Local Agencies	
Within SJCA Boundary	
Ambulance/Fire/Spill Emergency	757-396-3333
Police	757-396-7266
Outside SJCA Boundary	
Ambulance	911
Fire	911
Police	911
Hospital	
Maryview Medical Center	757-398-2200
Portsmouth Naval	757-953-5000
See Health and Safety plan for details and directions	
Regional Poison Control Center	800-282-5846
Federal Agencies	
Center for Disease Control	404-639-3311
LANTDIV	
ROICC-Pete Gorrell	757-396-5121 ext. 321
RPM- Dawn Hayes	757-322-4792
CNRMA-Valerie Walker	757-887-4775
PWC Facilities- Leroy Eaves	757-485-6574
JV I	
Project Manager-David Leadenham	757-318-9420
Site Superintendent-TBD	TBD
Site safety officer- TBD	TBD
Subcontractors	
Explosive Ordnance Technology, Inc. (EOTI)	732-345-8099

FIGURE 1-3
Emergency Coordinator Organization Chart
SJCA SITE 3



SECTION 2

Site-specific Information and Procedures

The following information is specific to the soil excavation activities at Site 3.

2.1 On-site Materials

All materials brought on site will be stored in accordance with manufacturers recommendations. All liquids will be stored such that if a spill were to occur, it will be contained within a limited area. Reactive materials will be stored away from other non compatible materials.

The types of materials required for this project will be minimal but may include the following:

- Diesel fuel
- Gasoline
- Grease
- Hydraulic fluid

The gasoline, grease, and hydraulic fluid will be limited to less than 5 gallons and these materials will be stored in approved containers. Diesel fuel used in the heavy equipment will be provided by a local supplier on an as need basis. The vendor will fuel the equipment directly and other 5-gallon containers used for emergencies. A fueling tank will not be on site.

2.2 Emergency Equipment

JV I will identify the closest source (local emergency response vendors) of adequate spill response equipment and materials. Common response equipment and materials could include a temporary holding tank, vacuum and submersible pumps, and appropriate hoses and connectors. Spill response materials will include absorbent materials and or sand. Other larger spill response equipment will include construction equipment used in ongoing site activities.

All equipment will be tested and maintained (in accordance with the emergency response vendors protocols) to assure its proper operation in time of emergency. After an emergency, all equipment will be decontaminated, cleaned, and fitted for its intended use before normal operations resume.

Equipment necessary for decontamination activities will be provided, installed, and verified to be in good working condition prior to any site operations. Equipment to be provided in the contamination reduction zone will include the following items:

- Wash pad
- Clean water supply

- Detergent solution
- Brushes
- Waste containers
- PPE and other protective wear

The location of the wash pad will be at the entrance of the Site 3 work area. This location may change depending on sequence of operations and conditions of the site at the time of mobilization.

2.3 Site Evacuation Signal and Routes

All site personnel, including equipment operators, technicians, and supervisory staff will evacuate the site upon hearing the evacuation signal. The signal will consist of a continuous blast from an air horn. The blast will be at least 15 seconds in duration, and will be sounded from the site trailer or a location that broadcasts clearly to the entire site. The signal will be repeated at least twice to alert all personnel. Radio base station personnel will also broadcast a verbal evacuation command over the site channel to alert those who may be in areas of excessive noise. A visual signal (clutching throat with hands) can also indicate evacuation requirements. If the SJCA has its own unique evacuation signal, the sound of that signal as well as Base evacuation procedures will be discussed with all site personnel.

After the evacuation signal is sounded, all personnel will immediately proceed to pre determined meeting points. Radio contact will be maintained between all meeting points. Wind direction will be noted during the evacuation. All attempts to reach an upwind meeting location must be taken. All equipment will be shut off and de-energized.

The Emergency Coordinator will contact all pertinent Navy authorities to inform them of the nature and extent of the emergency. A meeting point coordinator will be predetermined for each meeting point location.

2.4 Severe Weather

Short duration, high intensity rain showers may create unexpected erosion and drainage problems such as soil and containment berm erosion and ponding of water. Immediately after such events, all containment areas will be inspected for structural and practical integrity. Also, spillage or leakage will be immediately corrected. Repair to these devices will be made as soon as possible or at a minimum, prior to restarting any intrusive activities. damage/repairs will be documented in the Superintendents daily report. Excessive ponding of water will be allowed to naturally infiltrate into the ground.

2.5 Dust Control and Erosion Protection

JV I will provide dust control in the excavation areas and haul roads, during soil excavation, on site transportation, and placement of fill materials. The water source for use during dust control will be pre determined and approved by the Navy. Water will be applied in sufficient quantity to prevent creation of dust. However, excessive watering that may result

in a muddy condition will not be permitted. Determination of the need for dust control will be the responsibility of the JV I site superintendent.

All temporary erosion control measures will remain in place until vegetation has been established. Leaving these structures and devices intact will minimize the potential for soil/sediment loss to down gradient areas.

Appendix E
UXO Construction Support and Management Plan

UXO Support During Construction Activities
Interim Remedial Action (Phase II)
at Site 3
St. Juliens Creek Annex
Chesapeake, Virginia

Prepared for:

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Contract No. N62470-03-D-4401

October 2003

Prepared by:

AGVIQ
AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL
JOINT VENTURE

Virginia Beach, Virginia

Contents

Introduction **1**
General 1
References 1
Definitions 1
Background 2
UXO Safety 2
Location of Work 2
Site History 2
Chemical Warfare Materiel 3
UXO Team Composition and Qualifications 3
Responsibilities and Authority 4
Work and Safety Plans 4
Access Routes to Construction Support Locations 4
Construction Sites 5
Excavating at Potential OE Sites 6
OE/UXO Encountered 6

Table

1 Suspected CWM Data Report

2 Personal Protective Equipment Specifications

Attachments

A Basic Safety Concepts and Considerations for Ordnance and Explosives Operations

APPENDIX E

Introduction

The purpose of this document is to establish general guidelines and procedures that assure protection of CH2M HILL and Explosive Ordnance Technologies Inc. (EOTI) personnel and the public. This plan includes considerations unique to Ordnance and Explosives (OE) operations. EOTI is the Unexploded Ordnance (UXO) subcontractor for this project and has consulted with CH2M HILL on the development of this plan.

The objective of this plan is to provide supervisors and workers with the necessary information and guidance to maintain a safe and healthy work place environment. CH2M HILL and EOTI view safety and accident prevention as the first priority and place the burden of responsibility on all employees, consultants, and contractor/subcontractor team members. A copy of this plan is available to all employees, subcontractors, and visitors. All supervisors and workers are required to read this plan and sign a log acknowledging that they understand the plan prior to entering the work site. Personnel that violate policies contained in this document may be directed to leave the work site.

General

EOTI will augment CH2M HILL with Unexploded Ordnance (UXO) personnel to provide on-site safety support and avoidance of potential unexploded ordnance (UXO) contamination during performance of construction activities.

The UXO team will not move, touch or destroy any UXO encountered during the construction support phase of this project. The EOTI team will report all UXO to the CH2M HILL Supervisor. EOTI will provide qualified personnel and equipment to safely locate, identify, and report any OE hazard.

References

ETL 385-1-1 CEHNC Safety Concepts and Basic Considerations for Unexploded Ordnance Operations dated 22 May 2000. (See Attachment A).

Draft ETL 385-1-2 CEHNC Interim Guidance Ordnance Avoidance during Geotechnical Operations (August 1996)

EP 75-1-2 UXO Support During HTRW and Construction Activities

EM 385-1-1 Safety Requirements and Health Manual (3 September 1996)

Definitions

Ordnance and Explosive (OE). Bombs and warheads, guided and ballistic missiles, artillery, rocket and mortar ammunition, small arms ammunition, anti-personnel and anti-tank

mines, demolition charges, pyrotechnics, grenades, containerized and non-containerized explosives and propellants, military chemical agents and all similar and related items or components, explosive in nature or otherwise designed to cause damage to personnel or material. Soils with explosive constituents are considered to be OE if the concentration is sufficient to be reactive and present an imminent safety hazard.

Unexploded Ordnance (UXO). An item of explosive ordnance that has failed to function as designed or has been abandoned, discarded or improperly disposed of and is still capable of functioning and causing damage to personnel or material.

Inert Ordnance. An item that has functioned as designed, leaving an inert carrier. An item manufactured to serve a specific training purpose. Fragments from UXO.

Explosive Ordnance Disposal (EOD) Personnel. Active duty military EOD personnel.

UXO Personnel. Former EOD personnel employed by a contractor.

Chemical Warfare Material (CWM). CWM is defined as chemical agent material and/or associated equipment and surrounding contaminated media discovered either by chance or during deliberate real estate recovery/restoration operations that was previously disposed of as waste. CWM is classified as hazardous waste by the Army and not within the scope of the Army Chemical Surety Program.

Chemical Event. Discovery of an actual or suspected chemical agent or container that may require emergency transportation or disposal.

Background

UXO Safety

UXO is a safety hazard that may constitute an imminent and substantial danger to the personnel performing construction activities, other nearby site personnel and the public in general. UXO contamination must be considered a possibility on all formerly used defense sites and (FUDS) and active military installations. The surface danger zone of a range (active or inactive), the target area, impact area, ricochet area and the secondary danger zones may be contaminated with UXO. UXO may be found on the surface and/or subsurface. The varying types of ammunition, angle of fire and soil types preclude the accurate estimation of the depth of any subsurface UXO.

Location of Work

EOTI personnel will review the scope of work detailed in the work plan (WP). The WP describes specific descriptions of the project and the boundaries of the project site.

Site History

(See CH2M HILL WP/SSHP.)

Chemical Warfare Materiel

In the event suspect CWM is encountered, all work will cease immediately. Site workers will withdraw along cleared paths from the area containing the CWM. The EOTI Team Leader will clearly mark the area containing the CWM, and report the chemical event. EOTI UXO personnel will standby in an upwind location until relieved by a government representative. The POC will make the final determination as to the actual presence of CWM.

If the POC confirms the presence of CWM, the government person in charge will report the chemical event to the appropriate agencies.

When contacting the POC about suspect CWM, EOTI will provide the information. Contact with the POC will not be delayed due to lack of information. The suspect CWM report will follow the format in Table 1.

TABLE 1
Suspected CWM Data Report

1. Date and local time of event.
2. Location
3. Quantity and type of munition(s) or container(s) and chemical agents involved.
4. Description of what has happened.
5. Description of property damage.
6. Personnel casualties and/or injuries.
7. Whether medical services or facilities were required.
8. Assistance required.
9. Any other pertinent information.

UXO Team Composition and Qualifications

The following UXO personnel and procedures are proposed for use at the St. Juliens Creek site. Procedures used at the site will be followed until such time as the UXO supervisor and the CH2M HILL representative deem the procedures unnecessary.

UXO Team Leader. The UXO Team Leader for this project is Mr. Donald Koch. Mr. Koch is qualified for this position by virtue of training and experience. He has more than 20 years of military and civilian UXO experience. Mr. Koch is qualified for and has served as, Senior UXO Supervisor, UXO Supervisor, Site Safety Officer, and Quality Control Specialist. Mr. Koch attained Master EOD Technician level during his military EOD assignments. Duties and assignments include range clearance as a supervisor of multiple team operations and civilian UXO experience including performance as Senior UXO Supervisor for OE removal operations.

UXO Team Member. The UXO Team Member for this project is Mr. Lee Wallace. Mr. Wallace is a graduate of the U.S. Naval Explosive Ordnance School at Indian Head,

Maryland. Lee is an Explosive Ordnance Disposal Technician with over 15 years of combined military and civilian experience.

Responsibilities and Authority

The Team Leader is the technical lead for all ordnance/explosives operations and is assigned the following safety and health related responsibilities:

- Reports administratively to the CH2M HILL Site Supervisor, coordinating schedule and support requirements through that individual;
- Overall coordination between operations and safety, and health personnel;
- Reviewing and becoming familiar with the site WP and SSHP
- Early detection and identification of potential problem areas, including safety and health matters,
- Conduct and document UXO safety briefings for all site personnel and visitors.

Work and Safety Plans

UXO Specialists are required to comply with the provisions of the SSHP, WP, and all applicable Federal, State and local regulations. They report to their assigned UXO Supervisor for performing duties as member of functional teams. The UXO Team Leader will conduct UXO safety briefings for all site personnel and visitors.

Access Routes to Construction Support Locations

Prior to construction crews entering the site, EOTI will conduct a reconnaissance of the area for all construction locations identified in the work plan. The reconnaissance will include locating a clear path for the construction crews, vehicles and equipment to the approach site. The approach path, at a minimum will be twice the width of the widest vehicle (normally a minimum of 20'). EOTI will clearly mark all boundaries of the cleared approach path with pin flags or other suitable markers (normally yellow in color), to prevent personnel from straying into areas that have not been cleared. No personnel will be allowed outside the cleared paths.

If UXO is encountered on the surface, EOTI personnel will divert the approach path around the UXO, clearly mark the area with red pin flags or ribbon and report the UXO.

A magnetometer will be used to insure there is no subsurface UXO within the approach path. If a magnetic anomaly is encountered, EOTI will divert the path around the anomaly. Only EOTI personnel will operate magnetometers.

Construction Sites

EOTI will clearly mark the boundaries of the construction site. Personnel will not go outside the cleared area. As a minimum, the cleared area will be a square, with a side dimension equal to twice the length of the largest vehicle or piece of equipment to be brought on site.

EOTI will use a handheld magnetometer to clear an area prior to sub-surface construction operations commencing. At not more than a two-foot depth, a magnetometer sweep will be conducted to ensure that the excavation site is anomaly free. This procedure will be used to ensure that smaller items of UXO, undetectable from the surface can be detected. If no magnetic anomalies are located, the procedure will be repeated at two-foot intervals to the maximum depth of the excavation to be conducted.

The EOTI UXO team will monitor all excavation activities. One member of the team will be positioned to the rear and upwind of the excavation equipment for continuous visual observation of activities. If construction personnel unearth or otherwise encounters suspect UXO, all excavation activities will cease. The UXO team will assess the condition of the UXO and contact the CH2M HILL Site Supervisor. If a significant amount of UXO/ordnance related materials are observed the EOTI UXO team will cease operations pending complete geophysical mapping and UXO removal.

All EOTI personnel will use the following personal protective clothing (PPE) while on the site:

- Level D clothing, safety glasses or goggles, gloves, and safety shoes
- Hardhats, if an overhead hazard exist (backhoe, crane, forklift, or any other heavy equipment)

NOTE: EOTI personnel will not wear steel-toed shoes or other ferrous items on their person because of their interference with the operation of magnetometer/ordnance locators.

The following ordnance locators will be used to support this operation:

- The Schonstedt Models GA-52 and GA-72 magnetic locators will be used for sweeping and sub-surface range clearance operations. These locators are designed to detect the magnetic field between two sensors spaced inside the locators 20" and 14" apart, respectively.
- The Schonstedt Model MG-220 Magnetic Gradiometer will normally be used for subsurface drilling operations. The unit is designed to detect the presence of buried iron or steel objects. The unit responds when the magnetic field strength at the two sensors located in the sensor assembly is different.

NOTE: The primary disadvantage of these locators is their inability to respond to nonmagnetic materials such as gold, silver, copper, brass or aluminum; all of which can be found in certain types of military ordnance. Standard UXO Safety Precautions and techniques will be followed in support of this operation.

Excavating at Potential OE Sites

The project site is suspected of OE contamination, the UXO team will conduct a reconnaissance and OE avoidance to provide clear access routes to each site prior to excavation crews entering the area. The following procedures will be implemented:

- Prior to excavation crews entering OE sites, the UXO team will conduct a reconnaissance and OE avoidance activities to provide clear access routes to each site.
- The UXO team will identify, and clearly mark the boundaries of a clear approach path for the excavation crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the widest vehicle. No personnel will be allowed outside any marked boundary.
- On OE sites, a backhoe or other heavy equipment may be used by the UXO team to carefully excavate anomalies if believed to be at a greater depth than can be efficiently hand excavated. EMM will be used no closer than 1 foot to anomalies located during excavation. A team consisting of at least a UXO Technician and an equipment operator will perform the anomaly excavation with EMM.

OE/UXO Encountered

If OE/UXO is encountered on the surface, divert the approach around the OE/UXO, clearly, mark the area and report the OE/UXO.

A magnetometer shall be used to insure there is no subsurface UXO within the approach path. If an magnetic anomaly is encountered, assume it to be a UXO and divert the path around the anomaly. Only UXO personnel shall identify UXO and operate the magnetometer.

- **Excavation Procedures.** The UXO Team will monitor all excavation activities and provide appropriate response actions in accordance with site-specific WPs when CH2M HILL or its subcontractors are performing intrusive excavations in any area known or suspected to contain OE. Accordingly, a UXO Technician will be present at all excavations conducted in areas suspected to contain OE to visually locate and identify UXO.

  The UXO Technician will observe the excavation operation by standing in a safe area to the side of the excavator outside of the swing radius and will be responsible for examining the face of the excavation and the material as it is placed on a spoils pile or in the bed of a dump truck. The face of the excavation will be carefully observed to visually detect OE before they are disturbed. The UXO Technician will take advantage of natural or placed protective structures to shield himself from the potential hazard of falling or projected debris. Excavated materials will be spread out for further inspection prior to movement to a staging area to await characterization for further disposal. Another UXO Technician will be positioned at the final dump site to achieve a second inspection of the excavation spoils, if appropriate.

  The UXO Technician(s) will communicate with the excavator operator via hand-held radios and/or hand signals to stop the excavation if suspected OE are observed. When this happens, the excavator operator will immediately place the excavator bucket on the

ground, shut down the excavator, and depart the site to the contamination reduction zone. The UXO Technician will then examine the item to determine if it is UXO. If the item is determined to be UXO, it will be reported to the Field Supervisor. Excavations shall not be entered until protective systems are in place to prevent collapse of the excavation walls.

Excavation activities will not proceed if a UXO item is discovered that cannot be positively identified as inert material. Excavation will only resume after the item is disposed or removed from the excavation in accordance with the procedures outlined in the site-specific WPs.

TABLE 2
Personal Protective Equipment Specifications

PPE SPECIFICATIONS [a]

Task	Level	Body	Head	Respirator [b]
General site entry Surveying OE surveys and removals Observation of material loading for offsite disposal Oversight of remediation and construction	D	Work clothes; steel-toed, leather work boots [g]; work glove.	Hardhat [c] Safety glasses Ear protection [d]	None required
Tasks requiring OE/UXO anomaly reacquisition in contamination area	Modified D	Work clothes or cotton coveralls Boots: Steel-toed, chemical-resistant boots [g] OR steel-toed, leather work boots with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Safety glasses Ear protection [d]	None required
Tasks requiring upgrade or downgrade for reasons presented below	C	Coveralls: Polycoated Tyvek® Boots: Steel-toed, chemical-resistant boots [g] OR steel-toed, leather work boots [g] with outer rubber boot covers Gloves: Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat c Splash shield [c] Ear protection [d] Spectacle inserts	APR, full face, MSA Ultratwin or equivalent; with GME-H cartridges or equivalent.

Reasons for Upgrading or Downgrading Level of Protection

Upgrade[f]	Downgrade
• Request from individual performing tasks • Change in work tasks that will increase contact or potential contact with hazardous materials • Occurrence or likely occurrence of gas or vapor emission • Known or suspected presence of dermal hazards • Instrument action levels (Section 4.7) exceeded	• New information indicating that situation is less hazardous than originally thought • Change in site conditions that decreases the hazard • Change in work task that will reduce contact with hazardous materials

Notes:

a. Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.

b. No facial hair that would interfere with respirator fit is permitted.

c. Hardhat and splash-shield areas are to be determined by the SSC.

d. Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

e. Cartridge change-out schedule is at least every 8 hours (or one work day), except if relative humidity is >85 percent, or if organic vapor measurements are > midpoint of Level C range (refer to Section 4.7)—then at least every 4 hours. If encountered conditions are different than those anticipated in this HSP, contact the HSM.

f. Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SSC qualified at that level is present.

g. Steel-toed boots are not required during surface geophysics mapping.

Attachment A
Basic Safety Concepts and Considerations for Ordnance and Explosives Operations

Contents

1 Introduction A1-1
1.1 Purpose A1-1
1.2 Applicability A1-1
1.3 References A1-1
1.4 Distribution A1-1
1.5 Policy A1-1
1.6 Responsibilities A1-1
1.7 Terms and Definitions A1-2
1.8 General Safety Concerns and Procedures A1-2

2 Ordnance and Explosives Safety Precautions A2-1

3 Ordnance and Explosives Storage A3-1

4 Ordnance and Explosives Transportation A4-1

5 Exclusion Zone Operations A5-1

6 Ordnance and Explosives Excavation Operations A6-1

7 Ordnance and Explosives Disposal Operations A7-1

Appendixes

A References

CHAPTER 1

Introduction

1.1 Purpose

This pamphlet establishes the safe operating procedures for dealing with ordnance and explosives (OE) and unexploded ordnance (UXO) items on formerly used defense sites (FUDS), base realignment and closure (BRAC) and installation restoration (IR) projects. Because there are no absolute safe procedures for dealing with OE, merely procedures considered being least dangerous, it is essential that a planned and systematic approach be established.

1.2 Applicability

This pamphlet applies to all Headquarters, United States Army Corps of Engineers (HQUSACE) elements, United States Army Corps of Engineers (USACE) commands, and their contractors having the responsibility for performing OE response activities. For the purpose of this document, all references to OE include UXO.

1.3 References

Required and related publications are listed in appendix A.

1.4 Distribution

Approved for public release; distribution is unlimited.

1.5 Policy

It is the policy of the USACE to produce products and services that fully meet the customers' expectations of quality, timeliness and cost effectiveness. All OE response procedures must be formulated to ensure harmony with the USACE Strategic Vision and should be in concert with activities presented in other USACE guidance. There should be no compromise of health and safety requirements to meet production or quality goals. Safety is the leading edge of quality.

1.6 Responsibilities

It is the responsibility of all USACE and contractor personnel involved with OE response projects to safely execute them in accordance with (IAW) the approved plan, (SSHP), Work Plan (WP), and all applicable laws, regulations, and policies.

1.7 Terms and Definitions

a. Ordnance and Explosives. Ammunition, ammunition components, chemical or biological warfare materiel, or explosive that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried or fired. Such ammunition components and explosives are no longer under accountable record control of any DOD organization or activity.

b. Explosive Soil. Explosive soil refers to a mixture of explosives in soil, sand, clay or other solid media at concentrations such that the mixture itself is explosive.

c. Unexploded Ordnance (UXO). Military Munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to the operations, installations, personnel, or material, and remain unexploded either by malfunction, design, or any other cause.

d. UXO Qualified Personnel. The term UXO Qualified Personnel applies only to personnel meeting the requirements for the positions of UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, and the Senior UXO Supervisor.

e. OE Procedures. These procedures include, but are not limited to, the following actions preformed by a UXO qualified individual.

(1) Gaining access to (manual excavation) and identifying subsurface anomalies and assessing the condition of buried OE.
(2) Identifying and assessing the condition of surface OE.
(3) Recovery and final disposal of all OE.

f. OE Related procedures: These OE related procedures include, but are not limited to, the following and can be performed by a non-UXO qualified individual:

(1) Location and marking of subsurface anomalies.
(2) Location and marking of suspected surface OE.
(3) Transportation and storage of recovered OE.
(4) Utilizing earth-moving machinery (EMM). Earth-moving machinery may be used to excavate overburden within 12 inches of a suspected OE.

1.8 General Safety Concerns and Procedures

a. OE operations will not be conducted until a complete plan for the site is prepared and approved. These plans will be based upon limiting exposure to the minimum number of personnel, for the minimum time, to the least amount of OE consistent with safe and efficient operations.

b. Only UXO qualified personnel will perform OE procedures. Non-UXO personnel may be utilized to perform certain OE related procedures when supervised by UXO qualified personnel, i.e., mag/flag operations and gaining access using heavy equipment. All personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards of the procedures being performed. To ensure that these

procedures are performed to standards, all field personnel will be under the direct supervision of a UXO Technician III.

c. Personnel who will be handling OE items will not wear outer or inner garments having static electricity generating characteristics. Materials made of 100 percent polyester, nylon, silk and wool, are highly static producing. Refer to DA Pam 385-64 for more information regarding non-static producing clothing.

d. Prior to any action being performed on an ordnance item, all fuzing will be positively identified. This identification will consist of fuze type by function, condition (armed or unarmed), and the physical state/condition of the fuze, i.e., burned, broken, parts exposed/sheared etc.

CHAPTER 2

Ordnance and Explosives Safety Precautions

a. Every effort will be made to identify a suspect OE item. Under no circumstances will any OE be moved in an attempt to make a positive identification. The OE item will be visually examined for markings and other external features such as shape, size, and external fittings. If an unknown OE item is encountered, the on-site USACE representative will be notified immediately. If there is no USACE personnel on-site, the District or Design Center's OE Safety representative will be notified as soon as possible. If external research is required, it will be initiated by the U.S. Army Engineering and Support Center, Huntsville. The following are additional considerations for the safe handling of OE items.

   (1) Projectiles containing Base Detonating (BD) fuzes are to be considered armed if the round is fired.

   (2) Arming wires and pop-out pins on unarmed fuzes should be secured prior to any movement.

   (3) Do not depress plungers, turn vanes, rotate spindles, levers, setting rings or other external fittings on OE items. Such actions may arm or activate the OE.

   (4) Do not attempt to remove any fuze(s) from the OE. Do not dismantle or strip components from any OE items.

   (5) UXO Personnel are not authorized to inert any OE items found on-site.

   (6) OE /UXO items will not be taken from the site as souvenirs/training aids

   (7) Civil War ordnance will treated as any other OE.

b. Prior to entering areas/ranges contaminated with Improved Conventional Munitions (ICM) an approved DA weaver must be obtained. The District and/or Design Center's OE Safety representative must be notified.

c. Anytime during site activities a suspected chemical munition (CWM) is encountered, all work will cease, workers will evacuate upwind. A minimum of two UXO qualified individuals will position themselves upwind as far as possible to prevent unauthorized personnel from accidental exposure. The on site USACE OE Safety Specialist will be notified immediately. If a USACE OE Safety Specialist is not present the PM will contact the District or Design Center's OE Safety representative. The area will be secured until properly relieved, i.e., active duty Explosive Ordnance Disposal (EOD) personnel, Technical Escort Unit (TEU) or local authority.

d. Avoid inhalation and skin contact with smoke, fumes, and vapors of explosives and other related hazardous materials.

e. Consider OE items, which may have been exposed to fire and detonation, as extremely hazardous. Chemical and physical changes may have occurred to the contents, which might render it more sensitive than its original state.

f. Do not rely on the color coding of OE for positive identification. Munitions having incomplete or improper color codes have been encountered.

g. Avoid approaching the forward area of an OE item until it can be determined whether or not the item contains a shaped charge. The explosive jet, which is formed during detonation, can be lethal at great distances. Assume that all shaped charge munitions contain a piezoelectric (PZ) fuzing system until identified. PZ fuzing is extremely sensitive. They can function at the slightest physical change and can remain hazardous for an indefinite period of time.

h. Approach an unfired rocket motor from the side at a 45-degree angle. Accidental ignition can cause a missile hazard and hot exhaust.

i. Do not expose unfired rocket motors to any Electromagnetic Radiation (EMR) sources.

j. Consider an emplaced landmine armed until proven otherwise. It may be intentionally booby-trapped to deceive.

   (1) Many training mines contain spotting charges capable of inflicting serious injury.

   (2) Exercise extreme care with wooden mines that have been buried for long periods of time. Certain soil conditions can cause the wood to deteriorate and any inadvertent movement or pressure may initiate the fuze.

k. Assume that practice OE contains a live charge until it can be determined otherwise. Expended pyrotechnic and practice devices can contain red or white phosphorus residue. Due to incomplete combustion, the phosphorous residue may re-ignite spontaneously if the crust is broken and exposed to air.

l. Do not approach a smoking white phosphorous (WP) munition. Burning WP may detonate the explosive burster charge at anytime.

m. Foreign ordnance was returned to the United States for exploitation and subsequent disposal. Every effort will be made to research the applicable documentation and publications prior to commencement of a project.

n. Anomaly Avoidance Operations. Anomaly Avoidance procedures are detailed in:

   - *ETL 385-1-2, (Draft) Generic Scope of Work for Ordnance Avoidance Operations*, August 1996, and

   - *Ordnance and Explosives (OE) Center of Expertise (CX) Interim Guidance Document 99-01, Unexploded Ordnance (UXO) Support for Other Activities*, 5 February 1999.

CHAPTER 3

Ordnance and Explosives Storage

During OE projects, explosive storage falls into two categories, on-DOD installations and off-DOD installations.

a. On-DOD installations the provisions of DOD 6055.9 STD will be followed. Generally, the installation should have an explosive storage area that meets DOD standards. The permitting and compliance requirements are the responsibility of the installation. The compatibility of explosives found in Chapter 3, DOD 6055.9 STD will be followed. OE items waiting final disposition will not be stored with other explosives. Storage of commercial explosives require DOD hazard class storage compatibility group

b. In the event the installation does not have an existing storage facility, the provisions of paragraph c, in this section, will apply.

c. Off-DOD installations, the contractor will be responsible for the construction of a temporary explosive storage area. This temporary storage area will meet all local, state, and 27 CFR, Bureau of Alcohol Tobacco and Firearms (BATF) requirements and as much of DOD 6055.9 STD as is practical to implement. The establishment of a temporary explosive storage area must meet the following requirements.

   (1) The area will, if possible, meet the inhabited building and public traffic route distances specified in DOD 6055.9 STD. If the distances are less than required by the DOD guidance, a proposed barricading plan to protect the public from accidental detonation must be submitted and approved by the Huntsville Center's Structures Branch.

   (2) Magazines must meet the requirements of the BATF regulations, and each magazine must have a Net Explosive Weight (NEW) established for the explosives to be stored.

   (3) Each magazine must be grounded as specified in NFPA 780 and must meet the inter magazine distances as define in the DOD guidance.

   (4) A physical security survey will be conducted to determine if fencing or guards are required. This survey will be coordinated through local law enforcement agencies. Generally, a fence around the magazine is not needed IAW BATF regulations. However, it is the responsibility of the contractor for determining the degree of protection to prevent the theft of explosives and OE items.

   (5) A fire plan for either on or off-installation explosive storage areas will be prepared and coordinated with the local fire department. All magazines will have placards IAW 27 CFR/ATF P 5400.7 or DOD 6055.9 STD.

CHAPTER 4

Ordnance and Explosives Transportation

In the event that OE items must be transported off-site, the provisions of 49 CFR, DA Pam 385-64 state and local laws will be followed. These additional considerations are provided for the safe transportation of OE items:

a. USACE contractors are prohibited from transporting OE off-site for destruction until the provisions of paragraph 1-9, TB 700-2 are followed.

b. Do not transport WP munitions unless they are immersed in water, mud or wet sand.

c. If loose pyrotechnic, tracer, flare or similar mixtures are to be transported, they will be placed in #10 mineral oil or equivalent to minimize the fire and explosion hazards.

d. Incendiary loaded munitions should be placed on a bed of sand and covered with sand to help control the burn if a fire should start.

e. If an unfired rocket motor must be transported, it will be positioned in the vehicle parallel to the rear axle. This will afford maximum protection for the personnel operating the vehicle.

f. If a base-ejection projectile must be transported to a disposal area, the base will be oriented in the vehicle so that it is parallel to the rear axle. This will afford maximum protection for the personnel operating the vehicle.

g. OE with exposed hazardous fillers such as High Explosive (HE), will be placed in appropriate containers with packing material to prevent migration of the hazardous fillers. Padding should be added to protect the exposed filler from heat, shock and friction.

CHAPTER 5

Exclusion Zone Operations

On OE project sites, it is the responsibility of the contractor's UXO Safety Officer (UXOSO) to establish the exclusion zone for each UXO team. This exclusion zone should not be confused with the safe separation distance, which is maintained between teams.

a. The purpose of the exclusion zone is for the protection of non-essential project personnel and the public from blast overpressure and fragmentation hazards. There are two criteria for calculating exclusion zones;

   (1) Intentional Detonations. When destroying ordnance, both the hazards from fragmentation and overpressure must be considered. The minimum separation distances in DOD 6055.9 STD will be used unless otherwise stated. The maximum fragmentation and overpressure distances may also be calculated IAW HNC-ED-CS-S-98-1, Methods for predicting Primary Fragmentation Characteristics of Cased Munitions.

   (2) Unintentional Detonations. If the identification of OE on an OE site is unknown, the minimum separation distance specified in DOD 6055.9 STD, chapter 5, paragraph C5.5.4, will be used to establish the exclusion zones. When the identification of OE items are known, the exclusion zones will be determined by the U.S. Army Engineering and Support Center, Huntsville, (USAESCH) Engineering Directorate using HNC-ED-CS-S-98-1.

b. When multiple teams are working on site, a safe separation distance will be established. The minimum distance maintained between teams will never be less than 200 feet or the K50 overpressure distance. The one that is greater will be used.

c. While OE operations are being conducted, only personnel essential for the operation will be allowed in the exclusion zone. When non-essential personnel enter the exclusion zone, all OE operations will cease. In addition to this work stoppage, the following actions will be accomplished:

   (1) The individual(s) must receive a safety briefing and sign the visitor's log prior to entering the zone.

   (2) The individual(s) will be escorted by a UXO qualified individual.

   (3) All OE operations will cease within the radius of the exclusion zone for the areas to be visited.

d. All personnel working within the exclusion zone will comply with the following:

   (1) There will be no smoking within the exclusion zone, except in areas designated by the UXOSO.

   (2) There will be no open fires for heating or cooking (gas stoves, grills etc.) within the exclusion zone, except where authorized by the UXOSO.

   (3) During magnetometer operations, workers will have no metal parts in or on their shoes that would cause the magnetometer to present false indications.

CHAPTER 6

Ordnance and Explosives Excavation Operations

a. Hand excavation is the most reliable method for uncovering OE provided the item is near the surface. Hand excavation exposes personnel to the hazard of detonation for longer periods of time than any other method. Taking this into consideration, only UXO personnel will be used to accomplish this task.

b. Earth-Moving Machinery (EMM) may be used to excavate buried OE. EMM will not be used to excavate within 12 inches of a suspected OE. Once the EMM is within the 12 inches of the OE, the excavation will be completed by hand excavation methods. Personnel who are not UXO qualified can operate EMM only when supervised by a UXO Technician III.

   (1) If more than one EMM is to be used on site, they will observe the same safe separation distances required for multiple work teams.

   (2) During EMM excavation operations, only those personnel absolutely necessary for the operation will be within the exclusion zone.

   (3) EMM operations will be conducted with the guidelines of EM 385-1-1 and 29 CFR 1926 subpart P.

c. Excavation operations, whether by hand or EMM will employ a step down or offset access method. Under no circumstances will any excavation be made directly over the suspected OE.

CHAPTER 7

Ordnance and Explosives Disposal Operations

All demolition operations will be conducted IAW TM 60A 1-1-31 and the USAESCH Procedures for Demolition of Multiple Rounds on OE Sites. No other publications are to be used for these operations. Open burning of explosives, propellants, incendiary materials, and pyrotechnics is unauthorized.

a. As a general rule, all demolition operations will be accomplished by electrical means to assure maximum safety. There are exceptions to this requirement in situations where static electricity or Electromagnetic Radiation (EMR) hazards are present. Unintentional detonations can occur because of these induced currents (or lightning). The following precautions from TM 9-1375-213-12 are to be followed.

   (1) Premature detonation of electric blasting caps by induced current from radio frequency (RF) signals is possible. Refer to TM 9-1375-214 that shows the minimum safe distance in respect to transmitter power and indicates distance beyond which it is safe to conduct electric blasting even under the most adverse conditions.

   (2) Lightning is a hazard to both electric and non-electric blasting caps. A strike or a nearby miss is almost certain to initiate either type of cap or other sensitive explosive elements such as caps in delay detonators. Lightning strikes, even at distant locations, may cause extremely high local earth currents that may initiate electrical firing circuits. Effects of remote lightning strikes are multiplied by proximity to conducting elements, such as those found in buildings, fences, railroads, bridges, streams, and underground cables or conduits. The only safe procedure is to suspend all blasting activities during electrical storms and when one is impending.

   (3) Electric power lines also pose a hazard for electric initiating systems. It is recommended that any demolition operation closer than 155 meters to electric power lines be done with a non-electric system such as NON-EL. This non-electric firing system provides the same amount of safety and control as electrical firing systems, but without the interference of EMR and static electricity hazards.

   (4) Provisions of paragraph 1-9, TB 700-2 will be fully complied with prior to Corps contractors transporting OE off-site for destruction.

b. Personnel involved with demolition operations will not wear garments, which have static electricity generating characteristics. Materials such as polyester, nylon, silk or wool are highly static producing. No personnel handling demolition materials will wear any of these types of clothing. Refer to DA Pam 385-64 for more information regarding non-static producing clothing.

c. Only serviceable condition explosive material will be used for disposal operations.

d. The only acceptable disposal method is the one stated in the appropriate TM60 Series manual for specific ordnance types. Any commercial explosives being used will be equivalent to the military explosive required for the disposal operation.

NOTE: Oil well perforators/conventional shape charges are not acceptable substitutes for bulk explosives and will not be used for disposal operations except where applicable, refer to TM 60A-2-1-51. Otherwise these items are to be used only for the venting OE items prior to their turn-in as scrap.

e. If a situation dictates, protective measures to reduce shock, blast overpressure, and fragmentation will be taken. The USAESCH Engineering Directorate will assist in any design work and will review and approve all proposed protective works. As a minimum requirement all demolition shots will be tamped with clean earth or sand. IAW DOD 6055.9 STD the following separation distances will be observed unless otherwise directed by the Structures Branch.

(1) Minimum separation distance for non-fragmenting explosive materials will be no less than 1250 feet.

(2) Minimum separation distance for fragmenting explosive ordnance will be no less than 2500 feet. For bombs and projectiles with a diameter of 5 inches or greater, use a minimum distance of 4000 feet.

(3) Ordnance items with lifting lugs, strong backs, base plates, etc., will be oriented away from personnel, as fragments from these items tends to travel farther than normal.

f. Once demolition operations are completed, a thorough search of the demolition area will be conducted with a magnetometer to ensure a complete disposal was accomplished.

g. Inert ordnance will not be disposed of for scrap until the internal fillers/voids have been exposed and unconfined. Heat generated during the reclamation process can cause the inert fillers, moisture or air to expand and burst the sealed casings. In this situation, Oil Well Perforators can be used for venting these ordnance items which require demilitarization.

APPENDIX A

References

27 CFR 55	Alcohol, Tobacco Products and Firearms
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
49 CFR 100-199	Hazardous Materials Transportation
DOD 6055.9 STD	DOD Ammunition and Explosive Safety Standards, August 1997
AR 190- 11	Physical Security
DA PAM 385-64	Ammunition and Explosive Safety Standards
TM 9-1375-213-12	Operators and Organizational Maintenance Manual; Demolition Materials
TM 60A 1-1-22	EOD Procedures /General EOD Safety Procedures, April 1991
TM 60A 1-1-31	EOD Procedures/General Information on EOD Disposal Procedures, May 1994
EM 385-1-1	USACE Safety and Health Requirements Manual, September 1996
USAESCH	Procedures for Demolition of Multiple Rounds (consolidated shots) on Ordnance and Explosive Sites, August 1998.
ER 1110-1-8153	Ordnance and Explosives Response, 19 May 1998.
EP 1110-1-18	Ordnance and Explosives Response (Draft).
ATF P 5400.7	ATF Explosive Laws and Regulations, June 1990
HNC-ED-CS-S 98-1	Methods for Predicting Primary Fragmentation Characteristics of Cased Explosives, January 1998
HNC-ED-CS-S 98-2	Methods for Calculating Range to No More Than One Hazardous Fragment Per 600 Square Feet on OE Sites, January 1998
HNC-ED-CS-S 96-8	Guide Selection and Siting of Barricades for Selected OE, September 1997

Memorandum of Agreement, U.S. Army Engineering and Support Center, Huntsville, and Headquarters Forces Command, 52nd Ordnance Group, 18 July 1997.